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Individual Liability, Perceived Stress, Participant/Researcher Interaction,
Goal-Intention and PK-RNG Effects

Submitted for the Degree of Doctor of Philosophy
At the University of Northampton

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Sophie Louise Drennan

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ABSTRACT

The research within this thesis has been concerned with the concept of individual lability and how this may impact the occurrence of psychokinetic (PK) effects. Although frequently used as a descriptor within the fields of psychology, parapsychology has attempted to explore individual lability as a construct in its own right. Defined as an ‘ease of change’, within parapsychological research individual lability has been afforded the ability to either act as a contributing or mediating factor in the production of PK effects. To that effect, a major concern for this thesis was to operationalize the construct of individual lability via the development of a psychometric measure – an initial Lability Scale and then a further Revised Lability Scale.

In order to make sense of the theoretical assumptions about individual lability this thesis explores the background of the production of PK effects in both real-world and experimental environments. It identifies shared individual elements in the reports of PK effects relating to heightened arousal, neurological activity, personality traits, emotional states and creativity that may help to identify multiple dimensions of individual lability. Drawing on the perspectives of lability models which emphasize an interaction between differing lability levels of random systems as a predictor of PK effects, it is suggested that successful outcomes are more likely between high levels of one system and low levels of another system. For the purposes of the three empirical studies a Random Number Generator (RNG) with different levels of Table, Pseudo and Live were employed to explore this interaction.

An initial online survey consisting of measures of creative, neurological, state and Openness to Experience enabled the creation of the 71-item, 5 factor Lability Scale (LS) using factor analysis. Factors were defined as: Intuitive Cognition, Conceptual Cognition, Ego-Orientated Cognition, Emotional Interpretation and Analytical Cognition. The LS had good internal reliability and did not correlate with additional measures of anomalous experience and PK experiences, thus demonstrating face-value validity. The LS was subsequently employed in a series of three PK-RNG experiments exploring the lability interaction which incorporated a standardised design of a computerised I Ching task measured using the Q-sort method and separate group samples ($N = 50$). Study One included the impact of perceived stress, Study Two included the impact of the participant/research interaction, Study Three included the impact of goal-orientated striving. The primary hypothesis that levels of individual lability (Low, Medium, High) would significantly interact with Q-sort ratings of RNG system lability was not supported for all three experiments. In addition, the impact of the additional variables

was non-significant. However, significant correlations were found between all of the LS factors apart from Analytical Cognition. It was also observed that there was a significant difference between lability levels between genders, with males on average having lower lability levels. In addition, a final analysis combining the individual and RNG lability data from all three studies was conducted, although there was also no significant interaction effect found between levels of individual and RNG lability.

However, following the consistent lack of response from the Analytical Cognition factor it was deemed necessary to psychometrically refine the Lability Scale further. Therefore, a second factor analysis was conducted on the combined experimental data ($N = 147$) and the 32-item, 3 factor Revised Lability Scale was developed. Three identified factors were defined as: Creative Expression, Emotional Interpretation and Spiritual Interpretation. It was noted that the factor structure was somewhat reversed to that of the initial LS but the majority of items remained consistent. However, analysis showed that there was no interaction found between levels of individual lability and RNG lability. There were significant relationships between Creative Expression and Table RNG and Pseudo RNG lability levels. In addition, consistent difference between the genders in relation to the three factors were found with large effect sizes, with males having significantly lower levels overall.

The final Discussion questioned the lack of significant findings for the lability PK-RNG interaction in relation to the complexity of the methodology and the multiple variables introduced in the empirical studies.

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CHAPTER ONE

THE QUESTION OF PSYCHOKINESIS AND THE THESIS STRUCTURE

1. Introduction

This thesis is concerned with exploring a possible relationship between individual lability and external system lability with the parapsychological phenomena of psychokinetic (PK) experiences. Although the term ‘parapsychology’ was originally employed by German philosopher and psychologist Max Dessoir (Thalbourne & Rosenbaum, 1986) in the late nineteenth century using the Greek prefix of ‘para’ meaning ‘beside or alongside’ psychology to describe unusual occurrences, it was not given popular usage until Rhine adopted it in the 1940’s whilst beginning research into anomalous phenomena using statistical analyses (Thalbourne, 2003). As stated by Irwin (1999) in more recent years, the popular definition of parapsychology is:-

“...the scientific study of experiences which, if they are as they seem to be, are in principle outside the realm of human capabilities as presently conceived by conventional scientists.” (p. 1)

At this time, according to the Parapsychological Association, parapsychological research considers a principle triad of phenomena involving Extrasensory Perception (ESP), mind over matter interaction or psychokinesis (PK), and the possibility of existence after death. This thesis is concerned with the possible mechanisms involved with the production of PK effects, but the theories and findings from previous empirical research studies also touch on its sister process of ESP.

1.1. Psychokinesis

Within parapsychology, PK, more commonly known as being an occurrence of ‘mind over matter’, has been categorised as falling under the mantle of psi processes, the other process being that of Extra Sensory Perception (ESP). At this time it cannot be clearly ascertained whether these two processes are of a unitary or dual nature and research often evaluates findings in relation to both. Thalbourne (2003) has categorised two classes of PK – macro-PK and micro-PK. Macro-PK involves incidents whereby the movement of objects or

processes is able to be observed by the naked eye. This form of PK is commonly reported within ‘real-world’ environments or observational research with persons alleged to have PK abilities. Laboratory investigations primarily involve instances of micro- PK effects whereby small changes within processes are discernible through assessing the significance of statistical analyses. For the purposes of this thesis ‘PK’ is defined as being the ability of an individual to either consciously or unconsciously influence the external environment (Mauskopf & Mcvaugh, 1980).

The study of PK, although it proves to be relatively complicated, has stemmed from the multitude of ‘real-world’ incidents reported throughout history and occurring in differing cultures. Furthermore, there is an assumed belief, both within the research community and the general public, that there are individuals who may possess PK powers, with allegedly ‘gifted’ individuals potentially identified within experimental situations or encouraged to avail themselves for controlled testing, such as those with Matthew Manning (Manning, 1982; Tart & Palmer, 1979). Therefore, it is important to further our understanding of how and why PK effects may occur. Gaining conclusive empirical data over the years has proved to be elusive, as the primary characteristic of PK effects appears to be a lack of predictability. Yet, a case has been built from anecdotal reports and the results from laboratory-based research to suggest that PK effects may have a relationship with various individual processes and contextual factors (Alcock, 1981). Similarities with the PK effects from observed ‘gifted’ subjects to reports of poltergeist disturbances offers the question as to whether PK effects are a form of externalised maladaptive coping response when persons are exposed to stressful situations. In order to build upon this question, researchers such as Roe who have explored the inherent mechanisms involved within PK effects have proposed that the new psychological construct of lability may be of importance (Roe, Martin, & Drennan, 2010). Laboratory-based studies exploring theories regarding PK effects produced from the interaction between the different levels of lability within an individual’s internal processes and an external random system source have shown promising results.

1.2. Lability

The research presented within this thesis considers three main issues identified from previous literature. Firstly, to develop an understanding of individual lability. Lability is a relatively new concept within parapsychology and is defined as being the opposite of stability. Therefore, a process or system with labile properties has an ease of change throughout different levels. Although external systems are observed to have labile processes interpreted

by their randomness, individual lability as a potential psychological construct is yet to be thoroughly understood. Coupled with this lack of knowledge regarding lability, parapsychological researchers Stanford (1978) Braud (1980) and have previously offered two separate lability models which suggest that interactions between individual lability and external random system lability may enable PK effects. Thirdly, the empirical research conducted previously to explore the relationship between lability interactions and PK effects have so far offered inconclusive, albeit, encouraging results. Therefore, my purpose in this thesis is to focus particularly on the lability models proposed by both Stanford and Braud in order to test suggestions that an interaction between individual and external random system lability may produce PK effects, as discussed in the following sections.

1.3. Theories of lability as a mechanism for PK effects

Stanford (1978) developed his Conformance Behaviour Model (CBM) as one labile system requiring to conform to another, more robustly labile system in order to produce PK effects. According to Stanford, individual lability processes are removed from those of other physiological processes, such as cognitive or motor, and it is via the actual state of the individual that PK effects are more likely to occur. He theorised that within either an experimental or real-world environment the disposed lability system would be that of an individual. However, Stanford considered PK and ESP as being a unitary phenomenon within this model – the processes would apparently be adapted to suit the individual's intentions. This argument has a number of issues, as it clouds the exact nature of his explanations as to how PK effects can be differentiated through lability interactions. Furthermore it raises the question as to whether, regardless of the lability interactions, PK effects occur through conscious intention. Although this would support the findings observed through studies with allegedly 'gifted' individuals such as Nina Kulagina and Felicia Parise, it does not adequately address why PK is commonly characterised as being spontaneous.

Braud (1980) has theorised that PK effects are a production of system lability interaction via his Noise Reduction Model. Here, PK effects emerge from the interaction between a labile and an inert system. The 'noise' referred to is that of the interference an individual is subjected to from both internal and external sources and which is required to be filtered out in order to produce PK effects. Therefore, more lability within a system facilitates PK or psi functioning and more inertia lessens the likelihood. Braud paved the way for exploring individual lability through his suggestion that it could be measured and approached PK as being a separate process to that of ESP. Braud also proposed that individual lability is

likely not to be the sole precursor for PK effects to take place, but is part of a multi-factored process and conducted a variety of experimental studies in order to establish if additional variables may also impact on PK effects. However, although the model incorporates the impact of individual lability on PK effects, it was still unclear as to how individual lability should be assessed. Furthermore, it needs to be clearly established as to how lability interactions relate to the supposedly other contributing factors involved if internal and external inference needs to be reduced.

More recently, studies conducted by Thalbourne and Storm (2002; 2009) and Roe and colleagues (Roe, Davey, & Stevens, 2004; 2005; Holt & Roe, 2006; Roe, Martin, & Drennan, 2010) have explored the lability interaction through PK-RNG experiments using the divinatory I Ching method as a PK task. Earlier work by Schmidt (1972; 1973; 1974) found that Random Number Generators (RNGs) are a simple method to assess micro-PK effects via any minor changes in randomness that may achieve statistical significance. In this research, RNGs are used as the external labile system and the interaction between differing levels of this and individual lability are explored in relation to PK effects. Following with Braud's suggestion (1980) of measuring individual lability, Roe and colleagues employed a battery of self-report measures which they believed related to inherently labile physiological, cognitive and mental processes in order to assess individual lability levels. Findings showed support for Stanford's CBM model (1978), whereby an interaction was observed between high and low lability levels for each system. However, although these studies addressed the lability interaction and also a standardised and involving PK task, the use of a series of self-report measures needed to be refined in order to explore individual lability more comprehensively.

1.3.1. Summary

In essence, with these three concerns in mind, the primary research aim of this thesis was to better understand the construct of individual lability and in particular, identify specific contributing factors. This was to be achieved by developing a psychometric scale with which to measure individual lability using results from an initial survey consisting of existing self-report measures of individual differences and a subsequent factor analysis. It was then hoped that this newly devised Lability Scale would further explore the possible relationships with subjective PK and paranormal experiences. Furthermore, the Lability Scale was employed within a series of three PK-RNG experimental studies, which also included the I Ching as the PK task, and with three varying RNG levels in order to investigate the proposed lability interaction. Taking their cue from Braud, each of the studies included an additional variable

inspired by previous research – perceived stress, the participant/researcher interaction and goal-striving – in order to explore a possible multifactorial model of PK. Finally, using the data accrued from these empirical studies, the Lability Scale was refined further in order to identify inherent factors and the subsequent Revised Lability Scale used to explore the relationship with the lability interaction and PK effects. To conclude, the primary empirical findings and implications of the research will be discussed and the impact of gender on lability levels will be assessed as an integral additional variable for future lability research.

1.4. Outline of Thesis Structure

1.4.1. Chapter Three

In Chapter Three, the concept of lability, considered to be “...the ease with which a system can change from one state to another...” (Braud, 1980, p. 1), is specifically explored. Lability is described as being in direct contrast to ‘stability’ or ‘inertia’ – a lack of change. The research within this thesis focuses on the premises that labile processes within a system have the capacity to change when exposed to other labile systems, thus moderating psi effects. ‘Psi-conducive’ is taken to mean conditions contributing to the production of psi phenomena (Rush, 1977). Key theories regarding lability are reviewed including those offered by Braud, whereby lability within internal processes acts as a filter to constant external interference or ‘noise’. In addition, the Conformance Behaviour Model proposed by Stanford (1978), is reviewed, in which levels of lability within different systems have impact, with weak labile systems having the capacity to conform to a stronger labile system, thus mediating psi effects. ‘Psi-missing’ is used in reference to psi effects occurring contrary to intention, but still significantly more than by chance alone (Thalbourne, 2003). Given that these lability models were primarily theoretically concerned with the concept of individual lability and previous research had used a variety of different individual difference measures in order to assess levels, a key aim for the current research was to develop a singular comprehensive measure of individual lability. It is argued that such a measure of individual lability may be multifactorial with levels mirroring similar individual processes relating to creativity, cognitive, emotional and neurological functioning.

1.4.2. Chapter Four

Chapter Four initially provides details of the psychometric development of a comprehensive measure of individual lability, deemed the Lability Scale (LS), from a survey-based study. Measures included within this survey to assess individual lability were: The

Emotional Creativity Inventory (ECI) (Averill, 1999); The Creative Cognition Inventory (CCI) (Holt, 2007) Goldberg's Openness to Experience Scale (Goldberg, 1999); The Complex Partial Epileptic-like Signs Scale (CPES) of the Personal Philosophy Inventory (PPI) (Persinger & Makarec, 1987); Mood Lability (MOOD) (Akiskal, et al., 1995). Using factor analysis, the LS had a robust Cronbach's alpha ($\alpha = .86$) with five factors identified as Intuitive Cognition ($\alpha = .92$); Conceptual Cognition ($\alpha = .60$); Ego-Orientated Cognition ($\alpha = .78$); Emotional Interpretation ($\alpha = .71$); Analytical Cognition ($\alpha = .85$). Secondly, the relationship between individual lability, and additional variables of subjective paranormal beliefs and previous psychokinetic experiences included within the survey were also assessed using the measures of: the Anomalous Experience Inventory (AEI) (Gallagher, Kumar, & Pekala, 1994) and the Rhine Psychokinesis Questionnaire (RPQ) (Simmonds-Moore, Rhine Feather, & Gadd, 2010). Subsequent correlation results showed that there were significant negative relationships between individual lability and both paranormal belief and psychokinetic experiences. When each of the two subscales of the AEI, (Anomalous Experiences and Anomalous Ability), were explored against the five lability factors, no significant relationships were found between Creative Cognition and Anomalous Experiences and Anomalous Ability or the RPQ scores. Nor was there relationship between Analytical Cognition and Anomalous Ability scores. Furthermore, the pattern of the interaction between low levels of individual lability and high levels of both paranormal belief and psychokinetic experiences mirrored those predicted by Braud's lability model (1980). These preliminary results offered encouragement as to a similar pattern hypothesised between levels of individual lability and external random system lability in the following empirical PK-RNG studies.

1.4.3. Chapter Five

Chapter Five presents details of Experiment One which explores the contribution of individual lability and perceived subjective stress on PK-RNG effects. In addition, the methodology for the series of three PK-RNG experimental studies is offered. The methodology follows a standardised format in relation to the use of the Lability Scale and a computerised I Ching divination task and sample size of fifty participants. As a PK task the I Ching provides appropriate randomness and enables individuals to focus on a divination they hope to be offered. Participants are asked to rate each of the 64 I Ching divination readings beforehand as being either close to 'most accurate' (+7) or 'least accurate' (-7) on a Q-sort grid. PK effects are gauged if the divination received is close to being 'most accurate'. However, each study includes an additional variable that has been chosen from previous

research as being an impacting factor on PK effects. Experiment One includes the variable of perceived stress assessed using the self-report scale Perceived Stress Scale (PSS) (Cohen, Kamarck, & Mermelstein, 1983). The focus of this particular aspects falls in line with theories and results from spontaneous PK occurrences in real-world environments (Rogo, 1980); observation of ‘gifted’ individuals such as Nina Kulagina with a laboratory environment (Pratt & Keil, 1973; Ullman, 1971); and PK studies (Broughton & Perlstrom, 1986; 1992) it is hypothesised that moderate amounts of stress or arousal relate to the production of PK effects. Results did not achieve significance for the predicted interaction between individual lability and RNG system lability. There were no significant relationships found between individual lability and perceived subjective stress. However, there were significant differences found between the genders in relation to individual lability scores, particularly with the factors of Intuitive Cognition and Ego-Orientated Cognition, with males on average having lower scores.

1.4.4. Chapter Six

Chapter Six presents details of Experiment Two which explores the contribution of individual lability and the interaction between the participants and the researcher on PK-RNG effects. The methodology follows a standardised format in relation to the use of the Lability Scale and a computerised I Ching divination task and sample size of fifty participants. Additional measures exploring the participant/researcher relationship as viewed by each part were included. As highlighted within early PK experiments by Rhine (1948); later psi studies by Kennedy and Taddonio (1976); the admittance by Blackmore of possibly being an unconscious inhibitor (1985); and the work of Schlitz and Wiseman and colleagues, (Schlitz, Wiseman, Watt, & Radin, 2006; Wiseman & Schlitz, 1999) comparing the role of experimenter attitudes, the nature of the relationship between the participants and the experimenter and the attitude of the experimenter pose a critical factor in the production of psi effects. With experimental environments known to create variations in participant behaviour and performance, it was hypothesised that a more friendly rather than formal manner exhibited by the researcher would be more likely to produce PK effects.

1.4.5. Chapter Seven

1.4.6. Chapter Eight

Chapter Eight aggregates the data for the Lability Scale and the RNG system lability from across the three experimental studies in order to explore the interaction more comprehensively. At the same time, the initial Lability Scale was able to be refined using another factor analysis, the result of which was the Revised Lability Scale (RLS) of 32 items (Cronbach's $\alpha = .89$) comprising of three identified factors: Creative Expression ($\alpha = .89$); Emotional Interpretation ($\alpha = .89$); Spiritual Interpretation ($\alpha = .94$). The data from the Revised Lability Scale and the factors was employed to explore the lability interaction between RNG system lability further. The lability interaction was found to have just overshot the significance standard of $p < .05$ which is still promising in relation to future studies employing similar, albeit refined, PK-RNG methodology. Furthermore, there was a pattern showing that individuals who scored high lability levels had the greatest interaction with the lowest level of Table RNG lability system. In addition, gender was also included within the mixed ANOVA, and although there was no significant effect shown, there was a distinct bias for males to have the lowest levels of individual lability, which was consistent throughout the three experimental studies. It is therefore proposed that gender should be taken into consideration as being an important factor for future individual lability research.

1.4.7. Chapter Nine

Chapter Nine discusses the author's interpretations of the findings within this thesis, the possible limitations identified within the methodologies of the experimental studies and the implications for future individual lability and PK research – whether studied as separate options or combined – and the potential service the Revised Lability Scale may make to this. Although, overall, the predicted pattern of lability interaction was neither consistently replicated nor significant, there were definite trends observed in two of the three experiments and the combined data – individuals who scored on high lability interacted with the lowest level of Table RNG system. Furthermore, there needs to be a more thorough investigation into the apparent difference between levels of individual lability for males and females. In addition, with the findings from Experiment two exploring the participant/researcher relationship there is clear scope for examining whether individual lability is effected by environmental and situational dynamics. Lability as a situational response would fall very

much in line with the theories of spontaneous PK and poltergeist activity as a form of kinetic coping response when individuals are exposed to stressful occurrences.

1.4.8. Chapter Two

Chapter Two assess findings and theories relating to poltergeist activity and both macro and micro psychokinesis (PK) from field and survey studies in order to establish common elements which contribute to the occurrence of mind over matter scenarios. It explores the characteristics common to both phenomena and discuss factors that may impact on manifestation. It discusses factors pertaining to ‘living-agents’ and ‘gifted’ individuals or those persons that appear to be the focus of such activity. The progress of experimental PK studies is reviewed from the Victorian Age to the modern day. Particular attention is focused on the use of true random number generators (RNGs) random event generators (REGs) within the design. Pseudo random number generators are defined as being an algorithm that produces a series of numbers that approximates properties of a true RNG. The terms ‘Individual differences’ within the thesis relates to aspects of psychological, cognitive, emotional, behavioural and physiological processes and functions inherent to an individual and which are subject to quantifiable measurement. In addition, within this discussion on the role of individual differences in PK research, the concept of individual lability is introduced which is hypothesised to have a direct relationship either with the manifestation of PK effects or via an interaction with external random system lability.

1.4.9. Summary

Although this thesis has considered a variety of theoretical models and variables, there is still remarkable scope for further work. What could also be potentially included are the relationship between age and lability; the role of physiological processes such as cortisol levels in the production of PK effects; the nature of mental health issues and the perception of PK effects; and a more in-depth understanding of the individual experience of psi phenomena in general. Rather, the primary impetus of this work has been to address the nature of individual lability and how it may interact with external system lability to produce PK effects. As the voluntary participants recruited for the empirical studies were not questioned as to their prior knowledge or experience of psi phenomena, this has enabled them to subjectively interpret their own PK performance within the sessions. The aim was to explore the optimal conditions necessary to produce PK-RNG effects in a laboratory environment, following in the footsteps of Braud (1980), Stanford (1978), Storm and Thalbourne (2002), Roe (Roe, Davey, & Stevens, 2004) and Holt (Holt & Roe, 2006), and how the effects well may be

connected to individually labile processes. Although the empirical findings remain ambiguous, the researcher feels confident that she has improved our understanding of individual lability via the development of the Revised Lability Scale. Furthermore, rather than have these results close the door on further PK research, that she has actually offered fresh possibilities as to the nature of individual lability within gender, situational responses and its role in spontaneous PK effects.

CHAPTER TWO

PSYCHOKINESIS: BACKGROUND, HISTORY AND EMPIRICAL RESEARCH

2. Introduction

The purpose of this chapter is to introduce the concept of the parapsychological phenomenon of psychokinesis (PK) both within a theoretical framework and as a subjective experience. In order to offer a background into this phenomenon the general concept of psi is defined followed by explanations of the varying forms of PK. Theories relating to spontaneous PK phenomena developed from field investigations, both historic and more recent are reviewed. The anecdotal relationship between PK and poltergeist activity are considered and include a brief discussion on possible fraudulent activities that may have impacted previous reports. The role of individual differences is explored in order to argue their inclusion within the methodology of the empirical studies presented in subsequent chapters. Experimental research of PK, from the preliminary scientific endeavours of the Victorian Age, to the use of statistical analyses by J. B. Rhine and eventually through to the methodology favoured by modern researchers are discussed. Particular attention will be given to the use of external random systems and the type of PK task employed within experimental studies. Finally, specific variables identified within previous research are evaluated as to why they warrant further investigation. The aim of this chapter was to develop an understanding of PK characteristics which have been implied by the subjective experiences of individuals as well as results from observational and experimental research. This will build a basis for the inclusion of specific variables in the empirical PK studies detailed in the following chapters.

2.1. Definition of psi

The term psi was initially defined by Thouless and Wiesner (1942; 1946), as being an umbrella term encompassing a variety of anomalous phenomena. Two phenomena that have been of popular interest to researchers are that of extra sensory perception (ESP), and psychokinesis (PK). Opinion is divided as to whether these may be two separate processes or merely aspects of the same process (Thouless & Wiesner, 1948), consisting of cognitive (ESP) and kinetic (PK) systems. This ambiguity has meant that many research theories have considered both ESP and PK as explanatory to their arguments and research findings. The research within this thesis is concerned solely with PK or the capability of an individual to

exert an influence, either conscious or unconsciously, on the external environment, but due to this conceptual overlap, also touches on related findings from ESP research, too.

2.1.1. The different forms of psychokinesis: Macro and Micro PK

Psychokinesis is commonly referred to as instances of ‘mind over matter’, characterised as being either on a large (macro) or small (micro) scale. Heath (1999) offers a more pertinent definition of PK for this thesis as being a ‘mind-matter-interaction’ which is inclusive of either being a conscious ability or an unconscious occurrence. Macro PK is categorised by the obvious movement of an object which is therefore able to be seen by the naked eye. According to a glossary of parapsychological terminology compiled by Thalbourne in 2003, there are two distinct main types of macro psychokinesis, that of Recurrent Spontaneous Psychokinesis (RSPK) and also that of Isolated Spontaneous Psychokinesis (ISPK). Roll (1975) defines RSPK as a phenomenon that can occur frequently throughout relatively long periods of time and within the same place, generally centred around an individual. This type of PK is commonly associated with poltergeist activity (Beloff, 1974; Rogo, 1979a; Auerbach, 1986; Gerding, Wezelman, & Bierman, 2002). Secondly, in direct contrast ISPK as defined by Cox (1961) is a single, ‘one-off’ occurrence. This type is identified with PK effects manifesting during times of death or crisis, for example, the stopping of a clock or the inexplicable breaking of an object with personal connections to an individual at the time of death. Currently, research is being conducted online by the Rhine Institute at Duke University, North Carolina, into anecdotal reports of spontaneous PK instances occurring following a traumatic event such as a death. Common events include clocks stopping, pictures and other objects falling and breaking. Sometimes the items have a particular significance to the recently departed person (Heath, 2004). Nash (1978) offers that such occurrences are due to the physiological arousal caused by the shock of grief. This grief reaction is transformed into an abnormal coping response, where instead of being internalised, and manifesting in a physical disorder, it is externalised and directed at the focused objects – much like the externalised behaviour later advocated by Roll in his research with alleged poltergeist agents (1986). In addition, such an occurrence can be related to the ‘gifted’ individual Felice Parise who claimed that her first instance of producing PK effects immediately followed after she was notified of the death of her grandmother (see section 2.3.2.2).

However, attempting to formally investigate such unpredictable events is both a laborious and questionable undertaking. As noted by the Society for Psychical Research, in their “Notes for Investigators of Spontaneous Cases” there is no reliable method with which

to predict where or when or how long occurrences might occur in order to prepare an effective investigation (1968). In addition, even if PK effects do occur, there needs to be a suitable amount of reliable witnesses for verification and an attempt to objectively interpret and report subjective perceptions and observations. Therefore, in order to find a solution to this issue it has been necessary for researchers to adapt their enquiries within a more controlled environment by exploring instances of PK on a much smaller scale – those of micro-PK. Laboratory based micro-PK research is concerned with observing changes within statistical analyses rather than perceiving the obvious movement of an object (Broughton, 1991). As with other empirical methodology, micro-PK studies employ variables within the design which have the potential to be manipulated, thus generating predictive hypotheses as to how, when and why PK effects may occur. Following in this vein, this thesis offers research exploring the production of micro-PK within a controlled laboratory environment.

2.1.2. Spontaneity: The shared characteristic?

The characteristic seemingly corresponding to both forms of PK, is that of spontaneity. However, this also renders the manifestation of PK effects as being unpredictable. Due to this apparently unavoidable didactic, research has mainly eschewed the study of macro-PK within the field in favour of laboratory based micro-PK effects. However, there are experimental macro-PK studies. These are primarily focused on observing the conscious effort of possibly ‘gifted’ individuals within a controlled environment. However, it is debatable whether such occurrences are due to the integral abilities of an individual or through specific psi functions. At this time, there is still no accepted contributing relationship between emotional, behavioural, physiological, cognitive or even spiritual processes of an individual, coinciding with the occurrence of psi. Conversely, such a lack of findings may argue that PK research should be approached as a system, impacted by a multitude of individual and situational factors. Researchers are faced with the dual dilemma of not only trying to offer evidence of the existence of psi phenomena, but to simultaneously provide explanations of the salient characteristics. This further engenders the question as to whether establishing the existence of PK effects is useful. In order to offer an answer to this question, this thesis explores the occurrence of PK effects as a possible maladaptive stress response and test this proposition against the findings available. Supporting this argument, findings from research using gifted subjects, micro-PK studies and reports of macro-PK incidents have theorised that individuals may share commonalities in their emotional, cognitive and physiological reactions. Moreover, that the pattern of these different processes may be related to an abnormal coping response when exposed to a stressful situation. In order to better

understand such responses in real-world conditions and perhaps to predict PK occurrences, it is therefore necessary to investigate micro-PK effects in a controlled laboratory environment. To this end, recent PK research investigates a direct relationship between phenomena and individual variables including personality traits, emotions, physiological and cognitive processes (Thalbourne & Delin, 1993; Honorton, Ferrari, & Bem, 1998; Sartori, Massaccesi, Martinelli, & Tressoldi, 2004; Broughton, 2006). This thesis takes its cue from the basic assumption that PK does exist and may have direct interactions with such factors. Furthermore, it is proposed that instances of PK may be related to poltergeist phenomena, and share similar traits. Therefore, the following section reviews material on the attributes of poltergeist reports and PK manifestations.

2.2. Theories of poltergeist activity

Although there is a large body of both historical and contemporary anecdotal evidence to support theories connecting spontaneous macro-PK and poltergeist phenomena, it is not considered to have the objectivity necessary to substantiate scientific claims. However, this amassed literature clearly cannot be discounted completely and, as such, it has been possible to identify certain recurrent themes in regards to the type of circumstances and the individuals involved, especially when pertaining to emotional states. However, basic assumptions such as these have not yet been able to satisfactorily predict macro-PK and/or poltergeist activity, which appears to have more multi-faceted contributing processes. Therefore, following this avenue of enquiry, the next section intends to explore the nature of PK and poltergeist activity in greater detail.

The term ‘poltergeist’ is a derivation of the Old Germanic for a noisy or more literally ‘rumbling’ spirit. The defining characteristics of loud banging and percussive sounds which seem to emanate from nowhere, harkens back to this original terminology (Roll, 1977). Although the causation of any such activity is still very much open to debate, within parapsychology popular attributions range from the spontaneous occurrence of macro-PK (RSPK); occult forces; geophysical correlates; or an actual entity. Other associated features are ‘tantrum-like’ behaviour, commonly with items being thrown around or apported between different locations. Indeed Irwin (1999) states that the movement of objects is possibly the primary denominator in both poltergeist and PK events. Although such disturbances are generally not viewed as being life-threatening, individuals involved can come to physical harm, with impressions of being hit and bitten, often with corresponding bruising (Roll, 1972; Gerding, Wezelman, & Bierman, 2002). Owen (1984) states that the speed at which such

wounding appears suggests that it can only be the product of external forces, rather than from psychosomatic energy. However, as so little is also known about psychosomatic effects, Owen's argument extends beyond the remits of the evidence and remains unsupported.

Nevertheless, although the main characteristics of poltergeist manifestations are historically consistent across many cultures, it is apparent that explanations differ enormously (Hess, 1988a; 1988b; Machado, 2001). Rogo (1979a) observed that the idiosyncrasies of poltergeist phenomena are reflected in the social norms of the time - such as use of objects pertinent to cultural beliefs – pins and kitchen utensils in past years and in the modern world the most common focus being electrical and digital items (Rogo, 1986). Roll (1975) has offered further elucidation on the role of object focus, stating that objects within close proximity are more likely to be affected as are objects that have been affected previously. Although spates of poltergeist activity have been recorded throughout the last nine hundred years, there has been a lull in reported occurrences in more recent years.

The debate within parapsychology as to whether PK and poltergeist phenomena are related and how it impacts on the research presented within this thesis is further discussed in the following section. It reviews the history and characteristics of spontaneous PK occurrences and poltergeist activity from a variety of sources such as anecdotal reports, accumulated survey data, field investigations.

2.2.1. Relationship between PK and poltergeist activity

Heath (2003) acknowledges that sources of poltergeist and RSPK have a wealth of ecological validity from observing how the phenomenon exists in the real-world. However, the unpredictable nature of RSPK has necessitated that the majority of information has been gleaned from subjective accounts either from individuals directly involved or from the attending parapsychological investigators. In a handbook outlining how to investigate spontaneous cases, the Society for Psychical Research (SPR) even go so far as to advise:

“It is most unlikely that any worthwhile evidence for paranormality will be obtained in a poltergeist case which is no longer active” (1968, p. 9)

Yet, on noticeable occasions, both historical and recent, investigations have been conducted during the actual poltergeist activity. Although, to paraphrase Loyd Auerbach (1996), researchers have unfortunately so far not been able to persuade poltergeists to visit a laboratory to be investigated.

A compilation of poltergeist studies accumulated by Gauld and Cornell (1979) have reviewed historical cases and assessed the possibilities of providing rational explanations from already documented reports. Obviously, with historical cases, some dating back to the sixteenth century, it is nigh on impossible to interview any first hand witnesses, and testimonies were often recorded after a noticeable period of time had elapsed from the event – which begs the question as to whether such evidence can be deemed as reliable. Yet, compiled from numerous reports from various eras, cultures and countries, all of which have different traditions and no likelihood of direct communication, there are enough similarities to warrant the occurrences being placed within either PK or poltergeist categories. The main sources are often from personal diary entries, court records or officially witnessed by police officers. Details of the incidents are often considered objectively and a point made to firstly discover if natural causes are more likely. Gauld and Cornell (1979) also observe that there is a common assumption that poltergeist activity appears to centre on an adolescent and are often connected to emotional or psychological disturbance. Although it is unclear as to which states may be the causative factors, those proposed include repressed anger; sexual frustration; dysfunctional family environments; psychoticism; changes caused by both diagnosed and undiagnosed neurological conditions; and learning disorders. Plus, the favourite of Victorian physicians in diagnosing various female-specific maladies – nervous ‘hysteria’ – a psychosomatic condition which can manifest in bodily disorders and can be subject to mass episodes. However, initially they propose that events are distinguishable from haunting phenomena which is characterized as being within a particular location. Instead, poltergeists:-

“...where not fraudulent, are outbreaks of spontaneous paranormal physical phenomena centring upon the organism of some particular individual.” (Gauld & Cornell, 1979, p. 17)

Phenomena commonly begin with loud raps and banging which appear to emanate from all over rather than from a specific location. Following persons becoming aware of the apparently inexplicable sounds, other actions follow, including movement of small and large objects (often too heavy to be lifted by a single individual), doors opening and shutting (often when bolted shut) and in recent years, the malfunction of electrical items and telephones. Rarely, there are also quantities of water thrown around or discovered in odd places (such as mattresses) and more disturbingly – fire starting.

Louisa Rhine (1963) compiled findings from a large volume of reports of single instances of PK. She classified the physical effects observed in both PK and poltergeist activity, the majority of which involved the movement of inanimate objects. This research helped kick-start the burgeoning exploration of the processes involved in PK, with investigators now turning to the questions of how and why, rather than broadly trying to define what PK is. However, Rhine later lamented that although these findings were from credible case studies, by only describing what had occurred, the results could never be considered as concrete proof of the existence of PK (1986).

From the volume of poltergeist reports recorded throughout the years researchers have been able to gain valuable insight as to the shared factors of these and instances of ‘mind over matter’. This has culminated in theories directly proposing that poltergeist activity is not caused by a specific entity as such, but rather, as a form of unconscious and non-directional PK effects. Such effects are hypothesised to revolve around specific individuals within the immediate proximity of the occurrence who may have issues regarding emotional, behavioural and even neurological functioning. In order to gauge what these poltergeist incidents involve the following section reviews a series of ‘real-world’ incidents which highlights the similarities.

2.2.2. Poltergeist incidents in the ‘real-world’

Within the West in recent decades there has been a noticeable resurgence of interest following new reports. Infamous cases have occurred at Enfield, U.K. in the late 1970’s and also relatively recently in South Shields, U.K. (Hallowell & Ritson, 2008). The case of the Enfield poltergeist is interesting in that it still courts controversy as to the actuality of the documented phenomena. The episodes were filmed during the investigations and the subsequent images of individuals apparently being thrown about into the air proved to be startling, yet inconclusive. The possible individual agent was identified as an adolescent daughter within the house who, by her own admission, faked some of the activity in an attempt to catch the parapsychology researchers out. However, despite this, investigators were still able to verify other examples of apparent levitation and apport phenomena (Playfair, 1981).

A similar British poltergeist case in Andover which again occurred in the 1970’s recently had the sound recordings analysed by the original investigator Colvin (2008). The case involved two daughters in the family, one in particular, responding to and possibly communicating with a series of tapping and banging sounds. During the time of the events,

Colvin had spent time with the family in question in situ and had been very open with them regarding the often completely every day explanations of supposedly paranormal phenomena and the difficulties in having evidence of PK effects placed under scientific scrutiny.

Although the family had believed that the sounds emanated from an actual entity called 'Eric', following his investigation and having been witness to the sounds, Colvin concluded that the persistent bangs and rapping experienced were genuine and unconsciously caused by spontaneous PK effects from one of the daughters. He identified that in order for the sounds to occur it was necessary for this one female to be within the room (Colvin, 1977).

Unfortunately, Colvin was not able to provide any salient explanations as to how or why this daughter would be the catalyst of the occurrences and could only offer subjective speculations regarding her persona – "she was a very shy but pleasant girl, of small build, almost frail but otherwise physically sound. When relaxed, she was usually placid and rather unemotional. There was a feeling of loneliness with her and, although she was attractive, her friends were few." (p. 2). In addition, the technology of the day did not allow Colvin an opportunity to explore the nature of the sounds he had recorded during the investigation. However, more recently, innovative digital sound analysis revealed a distinct difference in the properties of the banging noises recorded at the time, which cannot yet be replicated by analyses of similar sounds (Colvin, 2008). These recent findings support that such audible rapping effects are not caused on purpose by the individuals involved or by other actions considered to be natural to the environment, but something as yet, not explainable. It is also suggestive that banging sounds often associated with poltergeist activity are perhaps emanations of energy either from the individual agents involved or the immediate environment which have their own distinct sound properties.

Recently, the world of parapsychological investigations has become of interest to the general public through the entertainment industry. The creation of popular television shows and blockbusting films continues to capture the public's attention and created a heightened awareness of the more sensationalized contribution theories. Almost twenty years ago Clarke (1995) noted that influence from the media was the second most commonly cited reason by members of the public for belief in the paranormal. However, there is still a sliver of theoretical truth within such glamour. Aside from the case studies already mentioned there is further evidence to support the theory that RSPK and poltergeist activity may be rooted in the same causal mechanistic processes. Beloff (1993) defines spontaneous PK events as unpredictable, unexpected and extremely unlikely to reoccur. However, some parapsychologists have suggested that to categorise poltergeist activity with occurrences of

RSPK may be overconfident in assuming knowledge of either and may ultimately prove to restrict the progression of understanding (Gauld & Cornell, 1979).

Roll (2007) explored the evidence for RSPK from seven real-world incidents in which he was the principal investigator. Roll proposed that PK effects are an externalised behavioural response of an individual agent which involve psychological and neuropsychological processes. As such, PK effects are a response to stimuli within the immediate external environment. In particular, perceived negativity from other individuals, especially those close to an individual agent. Roll conducted neuropsychological testing of two of the seven individual agents involved in these real-world cases, who were shown to be suffering from seizure disorders. However, such tests were not conducted on the other five individuals. In accordance to his theory that PK is an aberrant stress response, Roll had expected the agents to show high levels of arousal during these real-world PK incidents. However, in contrast, Roll recorded that he perceived that the individuals displayed a calmness instead. Yet, it can be argued that Roll's reports were based purely on observation and therefore could not qualify the subjective experience of the individual agent. Furthermore, chronic stress effects can cause the individual to have blighted responses, creating dulled and abnormal reactions to additional stressors (Boals & Banks, 2012).

The theory that physiological and psychological fluctuations are the primary cause of spontaneous PK and poltergeist disturbances has proved popular amongst researchers since early investigations. The argument is strengthened with the majority of individual agents generally categorised as being female (Podmore, 1963) ; and with a median age of fourteen years (Roll, 1977; Owen, Can we explain the poltergeist, 1984; Houran & Lange, 1997b). Support for the connection between PK manifestations and hormone regulation comes from a noticeable historical case in the thirteenth century of destructive and often disgusting poltergeist activity involving the devout Blessed Christina of Stommeln, which ceased at the onset of menopause (Gauld & Cornell, 1979). The more recent theories such as those by Roll (2007) and Rogo (1983) argue that it is the inability to control internal emotional stability when exposed to an external stressor that produces PK effects or poltergeist activity. Thus, such phenomena may be seen as being an externalized maladaptive coping response unwittingly unleashed by an individual under unbearable tension.

2.2.3. Poltergeist activity and emotions: The role of the poltergeist agent

Heath (2003) reiterates an idea proposed by Rogo (1974b), whereby the emotional states of so-called individual poltergeist agents may be of particular importance. Such states

include that of repressed aggression, plus a lack of appropriate avenues in order to vent such hostility, leaving the individual facing a psychological struggle. Rogo (1974b) previously theorised that some individuals are overly inhibited within stressful situations until an optimal high level of anger is achieved in which to overcome self-imposed restrictions, which induces PK effects. In order to explore this theory further, Rogo suggested using measures such as the Over-controlled Hostility Scale (OHS) (Megargee, 1966) and the Repression-Sensitization Scale (RS) (Byrne, 1961) within field research and empirical studies in order to quantify individual trait levels. However, such theories rely on the individuals involved being aware of their inhibitory behaviour, whereas, it is often assumed that individual agents involved with RSPK are unconscious of their role.

Whilst investigating a poltergeist disturbance in Newark, U. S. A. Roll and colleagues (1969; Roll & Persinger, 2001), theorised that the suspected individual agent (a young boy within the household) was actively suppressing his hostility for fear that it would germinate into actually having the capacity to kill. This fear had developed following his mother being incarcerated for murdering her husband after suffering years of spousal abuse. In line with this avenue of thought, Rogo (1980) explored the impact of immediate family dynamics on PK effects. He offers a gestalt theory in which PK activity not only stems from a singular individual agent, but also from the tensions arising from a dysfunctional communal environment.

This concept of sharing such an experience may also have connotations for cases where there are multiple witnesses to PK and poltergeist events. Further support for the impact of group interactions is shown in related research regarding pervasive stress within family dynamics (Pearlin & Turner, 1987), where “the household is wrapped in the mantle of the stressed person’s depression.” (p.153). An investigation conducted by Bononcini and Martelli (1983) with four male adolescents with possible PK abilities proposed that apparent poltergeist activity could dwindle following the individual agents awareness of their role within the disturbances and a burgeoning sense of responsibility. Another interesting result of this particular study is that all four of the males were believed to have abnormal personality variations in regards to restricted emotional and aggressive responses assessed using the Rorschach test. Furthermore, follow-up reports by Martelli found that PK effects and other paranormal occurrences waned as the males became older. The researchers surmised that PK effects were due to a combination of a disturbed personality and the dynamics of the surrounding environment. The researchers tentatively based their conclusion on the earlier

theories of Roll (1978) on a direct relationship between the central nervous system (CNS) and PK derived from exploring dissociative states associated with epileptic disorders.

Von Lucadou and colleagues (von Lucadou, Romer, & Walach, 2007) expressed similar views on the state of emotional tension and the impact of group consciousness when discussing the exploration of psi phenomena using General Quantum Theory (GQT) (Atmanspacher, Romer, & Walach, 2002) and the observance of entanglement correlations. These entanglements suggest a related web of emotional, behavioural, cognitive and situational variables impact on an individual or a group for psi effects to manifest. They suggest that, opposed to the common remit of scientific exploration in focusing on discovering causal attributes of a phenomena, that exploring the contributing factors of psi phenomena is paramount to furthering our understanding. In this respect, based on the GQT (Atmanspacher, Romer, & Walach, 2002), phenomena incorporate three aspects: 1) that there is a system; 2) that there are a variety of states; 3) that states are observable and are able to be investigated. In addition, that poltergeist activity is high in complexity due to the multi-dimensional relationship of the individual and contextual factors involved. In this regard, micro-PK is distinguishable from poltergeist activity as being only of intermediate complexity. However, von Lucadou et al. (von Lucadou, Romer, & Walach, 2007) propose that it can be explored effectively through empirical research by taking steps that the methodology is detrimental to the study of PK effects; that predictions focus on the contributing factors rather than causal mechanisms; and that it is preferable to include the potential for a variety of correlation entanglements. In this regard, they offer the research and findings presented by PEAR as being examples of good practice. However, this early commendation may be redundant in the light of findings from replication studies (see Section 2.5.2.). Following this proposal, von Lucadou (von Lucadou, 2011) further suggests that PK and poltergeist effects are potentially viewed on a socio-psycho-physical continuum, ranging from an endogenous psychosomatic response through to an exogenous PK response. Moreover, that rather than view PK effects as occurring from psychological and contextual forces that are physically measurable separately, instead, it is the entanglement correlation from the two entities that can be investigated. This, von Lucadou proposes, would mitigate the necessity of a 'Cartesian cut' or the discernment between endogenous and exogenous entities. This theory seems appropriate when considering the subjective nature of individual perspective as to what is considered internal and external. To support this notion, von Lucadou offers the example of persons with eating disorders, such as anorexia, who have a distorted representation of both the internal and external self within reality. This view may

also touch on the theory of transliminality, whereby boundary thinness enables the passage of information between conscious and unconscious states (see Section 3.5.3.). Furthermore, this amalgamation of internal and external processes may have an impact on the concept of lability as offered within this thesis. In order for such an entanglement to occur, it would seem likely that there would be a connecting synchronistic process involved which would enable the ease of passage from both sources. In this instance, lability may act as this aid, both via individual and external systems.

However, although a relationship between poltergeist activity and suppressed emotions such as aggression is one of the most popular and long-standing theoretical considerations (Fodor, 1958), it cannot be categorically stated that individuals involved with RSPK and poltergeist phenomena have distinguishing psychopathology. Martinez-Taboaz (1984) argues that clinicians and researchers involved in such cases may already be biased with the assumption that individual agents may be suffering from psychological problems (although it is already known that the majority of the general population experience such problems throughout their lives). Instead, he states that such individual agents may not have diagnosable mental health conditions or disorders involving the central nervous system CNS, and that to conclusively connect CNS activity with RSPK would not be scientifically possible at this stage.

Support for Rogo's (1980) theory is offered by Joines and Roll (2007) who state implicitly that incidents involving PK are produced as a response to emotional tension from individuals within the immediate environment. Following real-world investigations they also suggest that the moving of objects may involve some form of unconscious energy, such as electromagnetic emissions, from the alleged PK agent. However, the researchers debate that if an individual is able to transmit energy out to the immediate environment in the form of PK, it must be mediated by another mechanism – a type as yet unknown. This conclusion offers further support for a specific individual process to perhaps act as that mediating influence for PK effects.

However, when searching for appropriate explanations for real-world PK events, it is at first necessary to explore causation from known and existing factors. With the majority of PK and poltergeist disturbances reportedly involving young children or teenagers, there is a good case for deliberate fraud and trickery. Indeed, investigators within recent decades have also noticed a tendency for such young person's to lend activity a 'helping hand' (Nickell,

2001; Hollowell & Ritson, 2008), if they thought that interest was waning. Therefore, it is necessary to present a brief discussion on the impact of possible fraudulent PK activity.

2.2.4. *Fraud*

Fraudulent actions hark back to research involving Eusapia Palladino, the renowned medium of the Victorian era, who was observed to be very skilful at contortion in order to remove an arm from the hold of investigators to manifest an arm of an ‘apparition’ (Alvarado, 1993). Although, as with many instances of deliberate trickery when facilitating behaviour has either been discovered or admitted to (and despite determined efforts of sceptics), there is still a large proportion of phenomena that cannot be so easily explained away - in fact a staggering 92% according to Gauld and Cornell (1979). These include instances where objects are witnessed to move in strange trajectories, impossible under existing physical laws (Hollowell & Ritson, 2008). This holds true for the recent analyses of possible poltergeist raps by Colvin (2008) mentioned previously, which have shown that events believed to have a commonplace cause cannot be immediately disregarded. Furthermore, the ingenuity and skill that would have to be demonstrated by the young individual agents involved would be nigh on impossible. To reproduce some of the feats observed throughout the various poltergeist encounters would necessitate these adolescents being proficient conjurers, adept at sleight of hand and able to create incredible feats of engineering in order to move large objects such as wardrobes. However, as noted by Felicia Parise a ‘gifted’ individual (see section 2.3.2.2.), in an interview with parapsychological research Rosemarie Pilkington, just because a magician is able to produce similar effects to PK does not automatically refute that real PK effects exist (Pilkington, 2013).

As Morris (1986) noted, there is also room for both intentional and unintentional manipulation of objects in a controlled or observed environment. External materials can be effected by many factors caused by the physical presence of a living body, such as static electricity, heat and air-displacement. It is possible that many objects observed to be the target for PK effects manifested by a so-called ‘gifted’ individual are actually being affected by these natural mechanisms instead. There is also the possibility that targets are manipulated in advance of the experimental session, either by the individual participant or the researcher – a practice that appeared to be common in the mediumistic environments of the Victorian Age. Effects are subsequently interpreted as being anomalous based on the hopeful expectations of those observing.

2.8.1. RSPK and Poltergeist theories summary

To summarise, poltergeist and RSPK activity may be theorised as having various contributing elements (including occult; psychological; spiritual; geophysical), but consist of enough similarities to warrant a bond in regards to the mechanistic processes involved. It appears that the similarities connecting such theories are the roles of both individual differences and the environment.

Although anecdotal case studies reveal defining characteristics regarding emotional tension exhibited by individuals involved, it is still unclear how other contextual factors may impact. Many researchers have identified that manifestations may be the result of highly unsettled levels of emotional, psychological and physiological variables when exposed to stressful circumstances – resulting in an extreme form of maladaptive coping response. In their compilation of various historical and recent poltergeist reports, Gauld and Cornell (1979) offer that in some instances possible emotional conflicts inherent within individuals were unconsciously externalized into poltergeist manifestations, rather than in physiological disorders, although were not able to state how this could be achieved. Although classified as unpredictable by its very nature, in this instance identifying RSPK and poltergeist occurrences and the individuals involved may act as a predictive tool in diagnosing latent stress-related disorders. The lack of predictability and misinterpretation of events lends support to theories offered by sceptics, although the ultimate aim of conducting RSPK experiments within a laboratory environment is to transpose understanding to real-world events. However, it should not be presumed either from anecdotal accounts or from possibly biased psychological testing of individuals believed to be PK agents, that underlying disorders may be account for PK effects. Therefore, it is necessary for researchers to explore the bases of such anecdotal theories in a more scientific mien. Experimental studies are able to isolate specific factors that have been identified within such theories and explore them objectively within the rigours of scientific designs. However, transposing parapsychological theories which are themselves controversial, into the realms of science, has courted further controversy. Questions have been raised as to whether experimental methods are appropriate to study unpredictable and ambiguous phenomena such as PK. Therefore, the role of experimental parapsychological studies are now elaborated on further.

2.3. Beginnings of Experimental PK

In order to fully comprehend the progression in experimental PK research it is necessary to give a thorough overview of the early beginnings of quantitative study in

controlled environments. The following sections review how the initial attempts to conform to the strict standards required by science have developed into the common design methodology still used within current investigations, albeit with the addition of modern technology. The immediate section reviews the background research and literature regarding PK studies conducted within a controlled laboratory environment, beginning with the early interest stemming from the Spiritualist movement in the Victoria Age through to the modern day.

2.3.1. History of PK research: Mediums and séances in the 19th century

The Victorian age in Britain was renowned for being a period of intense and rapid development in industry, culture and the sciences. Scientific endeavours were seen as being the sole preserve of gentleman from the wealthier classes, who were further supervised by an elite core of medical and scientific luminaries, (Noakes, 2002). It was into this confusing mix of extremes that Spiritualism, initially emergent in America in the 1850's, was introduced, (Owen, 2004). The most salient characteristics of the Spiritualist movement were to be found within the séance environment and the crucial figure of the medium. The figure of the medium would act as conduit whilst in a trance state that the 'spirits' were able to communicate directly. This 'other-worldly' communication would commonly involve the apparent manipulation of physical objects within the séance environment, such as tables rapping and levitating, bells ringing and even musical instruments being played (Owen, 1989). As taking part in séances gained popularity with the middle and upper classes, correspondingly, there was a great need to identify individuals who could take on the mediumship role. Mediums during this active period of Spiritualism tended to be young females from the working classes who were 'discovered' and then promoted by wealthy patrons. At the time, females from this social status would have little or no education or means and would likely be highly amenable to being placed within a lucrative position. Yet, it is still very much debateable as to how much knowledge or even control they would have had in relation to the physical phenomena occurring within the séance environment. Therefore, in order for them to continue their careers it was imperative that the mediums ensured that paying sitters were convinced of their plausibility. As the majority of séances occurred in the homes of wealthy sitters, especially in London, (Inglis, 1992), there were standards imposed by the mediums by which sitters had to conform, apparently in order for the phenomena to manifest, (Noakes, 2002). Potential sitters were thoroughly checked before being allowed to attend exclusive circles, (Owen, 1989). With certain exceptions, the rooms in which they performed were kept dimmed, and mediums including Eva Fay and Rosina Showers, began to make use of a 'spirit cabinet' - usually erected by pulling curtains across a segment of the

room - out of which their fantastic 'spirit guides' would emerge, (Podmore, 1963). Mediums even began to bind themselves to furniture in an attempt to prove their authenticity. The Davenport Brothers were able to manipulate their muscles and joints to a remarkable extent in order to escape from bondage and to create desired effects (Inglis, 1992). They were able to move objects with their hands and feet whilst ostensibly still tied to chairs or to tables. Such suspicious phenomena could even be witnessed purely from the inference and suggestion of the medium, harking back to Spiritualism's origins in mesmerism, (Parssinen, 1977).

At the time, the Victorian media proclaimed that medium D. D. Home had gained mastery over the very laws of physics. One of the most notorious incidents within a séance involved him allegedly being able to levitate himself out of a window and back in through another window – all observed by reputable witnesses, (Conan Doyle, 1926). However, such an exhibition only served to provoke the scientific community who refuted Home's claims even more vociferously. It was acknowledged that certain mediums, including Eusapia Palladino, actively perpetrated fraud and trickery when they could, (Inglis, 1992), either because they were actual charlatans or, they did genuinely believe that they were visited by spirits. They created false situations to avoid disappointment, afraid of not being able to produce 'apparitions' for the sitters convenience. Therefore, the investigators were never entirely sure whether true phenomena were occurring and found it extremely difficult to create replicable results, (Crookes, 1871; Noakes, 2004). When confronted with refuting evidence, the mediums were able to state that they had no control over their own gifts, which were only really consistent in their unpredictability, (Romanes, 1881). This was something that sceptics and scientists viewed with suspicion, resulting in reports of ill-mannered behaviour during séances with individuals trying to manhandle the mediums, (Inglis, 1992). When experiments were conducted in a supposedly controlled laboratory environment, scientists felt both disappointed and vindicated that previously observed phenomena did not manifest satisfactorily, (Inglis, 1984).

The common scientific tools during the Victorian era were direct observation in the field and case studies, (Pels, 2003). Science was trying to be as thorough as possible by adhering to the strictures governing the laws of physics and theories were challenged only after the endorsement of the scientific community. What was and was not scientifically acceptable was regulated by individuals of consequence and those who dared to deviate from the norm were subject to social ostracism. Unfortunately, the eminent scientist Crookes only realized this following painful experience whilst investigating séances, (Noakes, 2004). The scientific community refused to accept Crooke's proffered explanations of séance phenomena,

even when he made a point to use science's own methods, (Crookes, 1871). He was seen as being a maverick and worse – bewitched by the young female mediums Florence Cook and Rosina Showers, whom he was investigating, (Owen, 1989).

It was deemed a prerequisite by the scientific community that phenomena must have a valid and objective explanation and one that must therefore remain within the established margins of physics, (Still & Dryden, 2004). However, the Spiritualist movement initially attempted to utilise these strict scientific adherences, but then recognized the need to dictate their own rules when confronted with bullying tactics. Questions were again raised as to whether the phenomenon witnessed was entirely natural or could be considered as having a supernatural element, (Noakes, 2004). If it was entirely natural and inherent within each individual, then there must be a degree of control. If there was such a thing as a 'psychic force' it inferred that there was something that could be controlled, either consciously or unconsciously, (Noakes, 2002). Even the use of the word 'force' denoted that there was a form of energy that would then adhere to the established laws of physics.

It was Carpenter who coined the phrase 'unconscious cerebration' in regards to physical phenomena within the séance environment, akin to what is now categorised as psi effects (Randall, 1982). He theorised that external effects were caused by the medium or even the sitters themselves, using unconscious internal psychic energy. He further believed that all cognitive processes within mankind were evolved to be automatic hence any apparent loss of control by an individual, such as witnessed within the séance environment, was a regression into something more primal. Therefore, only by being taught the correct usage of the processes involved would allow mastery, (Noakes, 2004). However, how this mastery over unconscious processes was to be achieved remained unexplained.

Inherent within in each new generation is the belief that it has the capabilities to answer unresolved scientific conundrums with the use of the technology of the day. This was particularly true within the Victorian era, with the advent of the Industrial Age, the newly developed instrumentation of the telegraph and the phonograph were used to try and record spirit voices, (Marvin, 1988). In order to explore the mechanistic processes of physical mediumship, electricity was also employed by investigators such as Crookes, with mediums integrated into circuits of copper wiring in order to assess apparent flows of energy. Any subsequent changes in the amplitude of the electrical current were offered as evidence of an occurrence, (Crookes, 1871). However, even with the addition of innovative technology and scientific methods, séance phenomena remained inexplicable and open to debate and derision.

2.3.2. *The medium as a PK agent?*

Yet, despite the instances of obvious fraud and the inherent Spiritualistic belief that phenomena were caused by spirits communicating from the ether, distinct parallels can be drawn between the séance scenario with poltergeist activity and PK effects. In all cases there is the suggestion that an individual agent is critical to the events at hand, whether consciously or unconsciously. Within the séance environment the medium is required to be within a trance-like state and is believed to have no conscious knowledge or control of the manifestations that occur within the environment, although they may display mental and physical fatigue following a trance. Owen (1989) shows that the scientific community and those within the medical profession during this period viewed those involved in mediumistic work as either having ‘manias’ (which were apparently the sole preserve of either females or the clergy); or possibly suffering from epilepsy. This latter proposition stemmed from the physical convulsions and verbal babbling observed during trances which were similar to the symptoms displayed in epileptic seizures. Owen quotes Maudsley, who defined those with seemingly supernatural abilities as “plainly no more...[the brain’s] natural nervous substrata engaged in disordinate, abnormal, or, so to speak, abnormal function.” (Maudsley, 1879, p. 303) as cited by (Owen, 1989). Regardless of any specific diagnosis, many scientists firmly believed that mediums and their behaviour were psychopathological (Owen, 1989). As Owen notes, it is not whether or not the individual mediums did have diagnosable mental or physical health disorders, but that the scientific community presumed that the occurrences within the séance presumed such. In addition, the prevalence of females both as mediums and sitters only heightened this presumption as the misogynistic views of the time held that females were naturally more emotionally labile, and therefore susceptible to manipulation. A new definition was added to the medical roll – that of a female medium being a ‘sensitive’. It was clear that the newly categorised ‘psychical’ research of the Victorian Age were definitely more absorbed with case studies of such ‘gifted’ individuals than the nature of the effects produced (Beloff, 1993). However, as much as science attempted to explain the behaviour of the physical mediums of the time, they were unable to produce answers regarding phenomena. Indeed, Owens (1984; 1989) notes that the noted psychical investigators of the time, such as Myers and Crookes, encouraged the mediums they worked with to not continue with physical mediumship, but to focus instead on more telepathic connections within a more controlled environment. The investigators hoped that by reducing the ‘noise’ of the séance environment would allow them to better identify the psychological processes involved, all be they already presumed to be caused by an organic illness.

Braude (1992) has stated that the exhibition of such physical mediumship is critical in evidencing PK effects. In an attempt to explain the relationship between the individual medium and PK activity, Braude (1986) proposed a ‘copy theory’, whereby the events in question are a reflection of their conscious or unconscious intention – an external copy of an internal state. On the surface, this theory has many similarities with the proposal of PK effects being a form of externalised coping behaviour. However, Haule (2010) has offered four arguments against this ‘copy theory’. Firstly, that to attempt to define an individual’s state is necessarily subjective, especially if that state is occurring during a trance or unconsciously. Secondly, that we are able to fluctuate through a spectrum of state aspects within the shortest of time periods. Thirdly, that PK effects are “whimsical in nature” (Haule, 2010, p. 208) and appear to be non-directional in their intention, negating the proposal that the effects are caused with a specific desire in mind. Finally the impact of the sitters, the other individuals within the séance environment, who could also be acting as the catalyst to the exhibited phenomena. In relation to the research conducted during the Victorian period there is no reference to other individuals in the séance environment being scientifically scrutinised during manifestation of phenomena. This last argument follows the concept of experimenter effects within laboratory-based studies. The second argument of Haule’s in relation to our ability to fluctuate rapidly and easily throughout states resonates with the concept of lability which is the focus of the research within this thesis and is discussed in depth within Chapter Three.

It is interesting to note that the researchers of the day also focused their attention more on the individual mediums, rather than the actuality of the phenomena. It apparent, that they too, were fascinated as to answering the questions as to how and why these events occurred rather than surmise whether they actually existed.

Following on from the line of enquiry by the Victorian researchers into mediumistic abilities, researchers in the modern age were keen to involve individuals with alleged PK abilities in PK studies and it is this research with ‘gifted’ subjects which is now discussed.

2.3.3. Observational research with ‘gifted’ subjects

Parallel to the use of PK-RNG studies within the laboratory in the 1970s, attention also began to be paid to individuals believed to have psychic abilities such as Uri Geller (Puthoff & Targ, 1974), Nina Kulagina (Ullman, 1971; 1974), Alla Vinogradova (Ullman, 1973) and Felicia Parise (Honorton, 1974; Watkins & Watkins, 1974).

2.3.2.1. *Nina Kulagina*

Nina Kulagina was a Russian grandmother with the apparent ability to move objects by no ordinary means and was described as being very self-effacing in character, regardless of the attention she gained from parapsychological researchers and the media. Many hypotheses on the characteristics of PK processes have stemmed from the experimental observations of Kulagina and her physiological practices. Kulagina is credited as being able to shift objects on flat surfaces from up to half a metre away, levitate them and create photographic effects. From physiological measures taken before and after such PK sessions she stated she experienced a copper taste in her mouth beforehand was known to exhibit a tremendous amount of strain with her pulse rate increasing dramatically, her breathing becoming rapid, pain in her lower back and neck and even vomiting. Following sessions she suffers from weight loss and raised blood sugar. During the actual movement of objects Kulagina stated that she could feel a corresponding sensation in her solar plexus and forehead area. It was observed by researchers that she performed best when alone or within a friendly experimental environment – too formal environments appeared to create more effort for her to produce PK effects (Ullman, 1973).

First-hand observations recorded by Pratt and Keil (1973) on the apparent voluntary movement of objects by Kulagina during informal sessions noted that such should not be taken as conclusive evidence of mind over matter. Firstly, they regret that her abilities may be greatly exaggerated by the media following the acute publicity and consequently further claims should be given veracity by serious scientific investigators. Secondly, that access to Kulagina in what was then the USSR was limited, and so any direct observation of her methods should be recorded and reviewed by peers for use with ‘gifted’ subjects in the West. Even during filming such informal session within a hotel room the researchers stated that the movement of objects such as a roll of film and a non-magnetic metal cylinder following Kulagina ‘concentrating strongly’ could not be explained as a normal occurrence. The researchers added other safe-guards to the objects, such as placing the cylinder under a glass and within a tray of aquarium gravel – where, it was still observed to move. Kulagina had a characteristic of moving her hands around the object of her focus when attempting to make it move. During another later visit, researchers noted that an initial attempt by Kulagina to move a small dish failed and she stated that she had not been trying any mind over matter for over a year. However, following a series of deep breaths a second attempt proved to be successful. The researchers subjectively perceived that Kulagina had not been trying hard enough during the first attempt, but her demeanour had changed to a more concentrated state on the second

and was 'obviously trying hard'. Although sessions with Kulagina were hampered by political red-tape, the researchers were keen to test Kulagina with objects of various consistencies that they had to hand. It appeared that she was able to move focus objects of metal, wood and Plexiglas, but not the upended glass that was often enclosing them. Pratt and Keil (1973) note that although such direct observations of Kulagina in action were in no doubt impressive, they were as yet, inconclusive in being able to prove PK abilities exist.

2.3.2.2. Felicia Parise

What is of note in these tests is that Felicia Parise was a research technician within the Maimonides Medical Centre where parapsychological research was being undertaken and where she had already participated in hypnotic dream studies with significant results. It was following watching a film of Kulagina which provided a direct impetus for her to practise the development of her own PK abilities. Her only guidelines were the recordings of Kulagina in action and she observed that PK effects appeared to be on provision of extreme physical and mental effort on the part of Kulagina. However, after trying to move objects both during deliberately relaxed and also tense states, she initially achieved success almost by accident following a phone call regarding her terminally ill grandmother in hospital. Parise was able to progress her own PK effects, by parroting the stress inducing physiological exertions of Kulagina. However, it is still unclear as to whether such strenuous effort - at one point her movements were so violent they dislodged EEG electrodes (Watkins & Watkins, 1974) - is pivotal in the production of PK effects, as according to McConnell (1983):

“...all spontaneous psychokinetic events entail physical power no greater than that expendable by one person in normal muscular activity.” (p. 120)

Parise herself stated that she needed to build a rapport with the focus object by concentrating solely on it and excluding interference of anything else. She describes her PK process as 'pitching' – wanting nothing more in that moment than having the object move. Physiological changes observed during these session involve increased perspiration, runny eyes and nose and slight confusion immediately afterwards. What is interesting that at least on one occasion, following a successful session, Parise commented that she had initially 'overshot' her desired state and only caused movement by bringing that effort back down (Honorton, 1974). Parise eventually stopped her PK sessions by saying that it was enough for her that she had managed to produce effects and did not want to subject herself to the constant criticism linked to the research.

A recent interview with Parise has been published where she discusses her working relationship with the primary investigator Charles Honorton and her thoughts on her own PK experiences (Pilkington, 2013). It is interesting to note that on numerous occasions she makes reference to having to have Honorton in attendance in order for her to display PK effects and his constant display of enthusiasm towards her trials. However, she also states that she was not aware at the time that Honorton described himself as being sceptical:

“.....I trusted him completely, and I think that’s why whenever I did anything with him the results were good. Had I known that Chuck didn’t believe PK could be done, I might never have tried to do it.” (Pilkington, 2013, p. 103).

This admission by Parise reverberates with the issue of experimenter effects are discussed further in Section 2.5.2, whereby it is argued that it is the participant’s perception of the how enthusiastic and motivated they are in the experimental environment that impacts on PK performance, rather than if they think they believe in the phenomenon or not.

In addition, Parise describes herself as knowing when PK effects were about to occur as she began to feel anxious and experience a physical sensation in her abdomen. These details do much to suggest that both the physiological and psychological state of the individual may be conducive to PK effects – an aspect which I covered in more depth in Section 2.5.1.

2.3.2.3. *Consequences of ‘gifted’ subject research*

Although individuals such as Kulagina and Parise appeared to be interested in discovering the processes involved in these effects and willingly subjected themselves to testing by parapsychologists, others appeared to be more interested in the notoriety the publicity surrounding them afforded. It cannot be denied that the production of what was considered to be evidence of macro-PK (the now ubiquitous spoon-bending; moving compass direction under a glass cover), was far more impressive and easier to understand for both the general public and the media than statistical results derived from within a laboratory. The following section outlines the advent of exploring PK in a scientific mien within the twentieth century.

2.4. J. B. Rhine: The onset of scientific methods beginning in the 1940's

Although the enthusiastic efforts of the Victorian age were the precursors of investigating parapsychological phenomena in a more rigorous and controlled fashion, it was not until the 1930's that J. B. Rhine really launched parapsychology into the fray as a worthy field of scientific study. Contrary to the work of the early Victorian psychical researchers, he was less concerned with testing for sensational PK effects via individual case studies with 'gifted' individuals, and more so with how PK effects could be investigated using consistent methodology (Beloff, 1993). In fact, one of Rhine's objectives was to show that PK effects were not the sole preserve of certain individuals, but were potentially inherent within the population.

Initially a biologist, Joseph Banks Rhine was inspired to follow a career in paranormal research after attending a talk on psychical research given by Sir Arthur Conan Doyle (Mauskopf & Mcvaugh, 1980). Previous to this time, the majority of reports concerning PK effects related to instances of observing macro-PK, normally within mediumistic sittings (Rush, 1986). However, in standing with his previous involvement in biology, Rhine (1944) advocated scientific methods by conducting PK studies within a laboratory environment, rather than trying to study spontaneous instances in a real-world setting. He was keen to transpose methodological remits from the scientific domain onto parapsychological studies which had previously been afforded less informal considerations. He introduced performing statistical analyses to gauge significance in order to create precision within findings which would be acceptable to the scientific community. Results were judged against a known level of probability or p-value, (now de rigueur within psychological research), where if an effect is less than this set p-value, it is deemed to occur more than by just chance alone. For PK research Rhine used $p = .01$, meaning that there would be a 1% probability of chance occurrence. After becoming acquainted with a gambler who believed that he could control the outcome of dice rolls, Rhine adopted this simple method of a random roll of dice for his preliminary attempts at understanding how individuals from the general population might have an influence on external events. As such research was so innovative at the time, there was scope to allow for error in the methodology and so make subsequent adjustments. During early investigations it was noted that when the dice fell, it was often on the faces with high numbers, especially on the six. It was discovered that ordinary dice, with either implanted or tooled 'spots' created infinitesimal bias to the faces due to unequal weightings - enough to skew results. Therefore, to eliminate this bias precisely calibrated dice, as found within casinos, were obtained. Furthermore, in an attempt to further eliminate potential confounding

factors, rather than have an individual actually throw the dice by hand, Rhine implemented a progression of basic, yet effective rolling methods, first using a container to shake the dice within, then a board to roll the dice down, and then later, with an automated turning machine. So keen was Rhine and his associates to perfect methodological techniques in order to reduce possible known biases it was nine years before publishing the significant results of their PK studies (Rhine, 2001).

Throughout the years of trials and significant results, Rhine discovered that there was a definite pattern to the PK effects observed. Trials were divided into quarters, and it was from this that researchers noticed a quarterly decline effect (QD) with PK performance obtaining significance in the initial quarter and gradually decreasing towards the fourth quarter. Furthermore, internal effects were also observed following more detailed analysis of the actual sets of dice rolls within each quarter, with peaks of PK performance more prominent in the first rolls. This pattern is similar to the phenomenon of ‘beginner’s luck’ or initial winning scenarios in gambling situations (Cummins, Nadorff, & Kelly, 2009). Also noted, were recovery effects, whereby towards the end of a series of rolls and the rolling sequence, performance would begin to increase, resulting in a distinct ‘U’ shaped performance curve. This observation has generated interest as it lends support to the relationship between psi phenomena and unconscious psychological processes involved, rather than PK being an isolated effect or caused solely by tiredness. Connections can be drawn between levels of motivation and absorbance in the task at the beginning of the experimental session. Decline effects occur when boredom sets in and absorbance in the given task begins to wane. The increase in performance towards the end of the session occurs when the participants again consciously focus attention once more on the task at hand. However, subsequent investigations have not consistently replicated these decline effects and are therefore still open to debate. Interestingly, the original gambler who acted as a catalyst for Rhine’s research stated that only when he reached a state he referred to as being ‘hot’ did he believe that he could influence the dice. This ambiguous statement could be perceived as pertaining to a certain level of emotional, physiological or cognitive arousal. This has led into a line of enquiry into more ‘process-orientated’ rather than ‘proof-orientated’ research for PK effects which is further discussed within this chapter.

Once the occurrence of PK effects had been established within the laboratory environment, Rhine then began to explore these possible psychological correlates of psi further. The designs employed to test PK commonly involved the participants remaining blind to the nature of the study and to their performance. Hence, the significant results obtained

hinted that PK effects could be produced via unconscious processes. However, Rhine was very much aware that regardless of the results, both positive and negative, being obtained within the experimental environment, the impact of individual differences and contextual factors should always be taken into consideration (Rhine, 1944; 1948).

2.4.1. Criticisms of Rhine's research

However, these early investigations into establishing PK effects have drawn major criticism from investigators such as Girden (1962a), not least regarding what he terms 'dubious' methodology. Investigators were accused of only offering significant findings after aggregating large amounts of data and to make changes to an experiment during the midst of a study if it was thought that the procedure was not providing favourable results. Plus, there was the long wait of nine years in between beginning PK research and the first published findings.

And yet, these criticisms can also be argued against by noting that the delay in publication was deemed necessary as the novelty of parapsychological investigations being studied seriously was a controversial concept for the scientific community and general public, alike. The experimental methods employed by Rhine were still within the formative stages and so were therefore, being constantly refined. Plus, even when limitations such as bias were exposed and counteracted within the dice rolling experiments, subsequent findings were still reaching statistical significance. Rhine was also able to establish that PK effects on dice rolls did not follow the normative laws of mechanics – the weight, size and number of dice rolled during trials (ninety-six being the highest number during one trial) did not inversely correlate to predicted PK effects (Mauskopf & Mcvaugh, 1980). Independent analysis of the 'U' shaped patterns were conducted by Pratt at the time and found to occur in smaller and smaller subsets of trials. Furthermore, as noted by Radin and Ferrari's 1991 meta-analysis, studies did not take into consideration any reported moderating variables contained within the design of these dice studies, such as immediate and delayed feedback, paranormal beliefs and previous psi experiences. In support of the somewhat basic procedures involved with Rhine's studies, Louise Rhine (1970), later stated that the obvious simplicity of the equipment and methodology was an asset and provided an element of entertainment within the PK task for participants - a relevant aspect that is discussed later (Section 5.4). In addition, the majority of the PK experiments were still concerned with macro-PK or the movement of relatively large objects, such as die and coins. Even though the size, mass or number of objects appeared not to be a hindrance for PK effects, there were still subject to interference. Although design

remits were in place in order to minimise inference, either human or environmental, these confounds should still have been taken into consideration when trying to establish a representative statistical significance.

Furthermore, as noted by Beloff (1993), Rhine did not achieve any of the objectives he set out to explore during his work – to develop a sound methodology to investigate psi effects; to have parapsychology accepted as a recognised field; and to show that psi abilities are possibly generic.

However, in this new millennium, although researcher are still exploring the optimal conditions for psi both with sample populations and ‘gifted’ individuals parapsychology has been accepted as a valid field of study. Without the endeavours of Rhine and his colleagues to refine the experimental and statistical methodology, the exploration of parapsychology may not be as evolved as it is today and as suggested by Beloff (1993), has enabled the field to become respectable.

2.4.2. Cascade tasks

Gradually, the trend for observing patterns within random die rolling sequences eventually subsided in the 1960s in favour of placement methodology, stimulated by the designs of the Swedish engineer Forwald (1954; 1955; 1961). In this instance, individuals attempt to influence the direction and position of randomly falling objects within a cascade. This further allowed for greater measurement of the PK effect by using a simple design of having the target objects fall onto a pre-marked grid. Although Forwald had the tendency to use himself within a single participant design he still was able to replicate the internal position effects pattern observed in the previous dice trials by Rhine.

It was following this decade of testing that the frustrating lack of reliably replicable results and scathing sceptical criticisms probably added to the decline in PK research in preference of investigations into other phenomena such as ESP. However, with the advent of new technology, PK research was once again thrust into the forefront of parapsychological investigations in the late 1970’s, this time from the Princeton Engineering Anomalies Research unit (PEAR).

2.5. The PEAR laboratory: 1970’s

Established in 1979 and running for almost 30 years, the Princeton Engineering Anomalies Research (PEAR) laboratory emphasized that the studies undertaken to investigate anomalous events were academically based, using very rigorous scientific and technological

methods. To this end they created an eleven step hierarchy of questions that studies should explore. Out of the series it is steps four, six and seven that are most pertinent to the current research – are there characteristic structures; primary physical correlates or subjective correlates. Through exploring these strategies arose the question of whether there are pragmatic applications to discovering the nature of PK effects.

Similarly to the research conducted by Rhine, PEAR also recognized the need to accumulate large databases in order to detect these very small, yet significant, effect sizes. However, the primary difference was that PEAR developed methodology exploring micro-PK effects rather than the macro-PK effects. To this end, random event sources were included within the design, with PK effects determined by significant statistical fluctuations from randomness. Such electronic random systems effectively reduced the need to consider extraneous human or environmental interference producing cleaner statistical results. What is of interest to the current research were the automated computer generated true random event and number (REG, RNG) programs which used a commercial noise diode enabled researchers to adequately control any possibility of extraneous bias when looking for PK effects. The use of automated random systems enabled the researches to assuage criticisms of possible intentional human manipulation and bias. Experiments using such REGs established PK effects by observing whether there were shifts in the mean of high-intention, low-intention or baseline directions. Although effect sizes were small, they were still consistently significant for deviations for high and low intention and from high to low throughout a lengthy twelve year period (Jahn, Dunne, Nelson, Dobyns, & Bradish, 1997).

The PEAR studies were also concerned with whether the type of randomness was necessary to produce PK effects, hence employing a variety of automated REG designs within their studies including true random sources such as the noise diode, but which also included pseudorandom generators, pendulums, water fountains and mechanical cascades, (similar to that used earlier by Forwald. (1954)). Unfortunately, over twenty years later data analyses had still not yet been completed, apparently due to the sheer volume of data accrued (Jahn & Dunne, 2005). At this time, some findings are still pending. Studies concerning a random mechanical cascade (RMC) of nine thousand polystyrene balls falling through a quincunx array of three hundred and eighty pins into a possible nineteen collecting bins at the bottom were performed with. The main statistical analyses were for high-low comparisons with significant findings relating to pre-stated intention and subsequent PK effects regarding the mean difference between right, left or baseline directionality $F(2, 3390) = 8.13, p = 3 \times 10^{-4}$, (Dunne, Nelson, & Jahn, 1988). Subsequent patterns were determined from observing high –

baseline and low-baseline comparisons. However, interspersing two levels of randomness blindly found that significant results occurred with pseudo random levels, but had surprisingly reverted back to non-significance for the true randomness source. Yet, these results may be misleading, as no other variables within the study were taken into consideration as possible correlates for these effects.

The studies were also able to show that although many had similar or identical methodological protocols in place regarding equipment, sample pools, environment, this did not equivocate to achieving similar results – although they were often still significantly anomalous. This lack of replicability was also to be observed in studies with certain individual operators producing consistent results, but whose performances differed entirely from those within earlier identical studies. The fact that these individuals could produce consistent results, albeit dissimilar is suggestive that PK effects are dependent on a variety of factors, both internal and external, highlighting the spontaneous nature of the phenomena. Furthermore, the noticeable ‘U’ shaped decline and recovery effects were also in evidence both within large series performance and smaller subset results (Dunne, Dobyns, Jahn, & Nelson, 1994). What was of interest was a distinct difference in findings between males and females, as outlined in both a summary of the twelve years of PEAR research (Jahn, Dunne, Nelson, Dobyns, & Bradish, 1997) and a specific assessment exploring gender differences in PK-REG effects of over 270 database sets (Dunne, 1998). Although it was observed that both genders had the most significant results interaction with high levels of REG, as opposed to low levels, findings showed that on average, male participants had stronger correlations with operator pre-intentions to alter different levels of REG. Furthermore, males displayed more of a symmetrical pattern of distribution when attempting to interact with both high and low levels, whereas when females interact with low levels, their results predominantly showed an opposing result. The distribution pattern of males tended to keep within normal parameters, although females displayed larger variances within their scores. What is of interest to the current research is that the researchers concluded that these apparent gender differences may be an indicative characteristic of PK-REG system effects.

2.5.1. Unaddressed factors in the PEAR laboratory research

However, it must be pointed out that PEAR deliberately did not administer any psychological measures or assess any physiological measure levels or explore further the possible goal-achieving strategies employed by participants and so could not establish any possible relationships from these excluded factors. Furthermore, the PEAR proposition (Jahn

& Dunne, 2005), states that the atmosphere of the unit and the general attitudes of the research staff were friendly and inviting, as it was believed that this would assist participants' performance as:

“...the anomalous phenomena being sought are somehow nurtured in the childlike, limbic psyche and therefore could well be suppressed or even suffocated by an excessively clinical or sterile research environment.” (pp. 225-226)

However, empirical exploration of this interesting conviction regarding participant and researcher interaction was not forthcoming during the period of investigation.

Over its operational duration, PEAR laboratory had taken great strides towards convincing the scientific community of the viability of studying PK using random systems within a controlled experimental environment. With research teams comprised of parapsychologists, psychologists and physicists the experimental procedures necessarily provided greater scope for isolating the variables under scrutiny and identifying additional confounding factors that may have influenced results. However, the research had primarily focused on investigating PK effects using participants from the general population as opposed to exploring individuals that may already have been tested for and identified as having PK abilities.

2.5.2. PEAR replication studies: Mind/Machine Interaction Consortium

In 1996, a consortium involving research groups in the U.S.A. and Germany was formed in order to attempt a replication of the original PEAR experiments exploring direct human intention on REGS and which produced significant findings (Jahn R. , et al., 2000). Although identical in nature to the equipment and protocols employed, finding failed to replicate the statistical significance or effect sizes found previously. In addition, conclusions reached by PEAR after twenty-five years of study, such as that of gender bias, were also not found. Particularly damning were the irregularities in the baseline readings of REGs which were found to deviate from randomness. In addition, further exploration of the original data showed that the prior significance could be attributed to the results of specific individuals. Thus, the initial case presented by the PEAR laboratory that PK effects were likely to be inherent throughout the general population appears to now be unsubstantiated. Instead, there is now the potential using the findings from the consortium and those of the initial PEAR experiments to now suggest that PK effects may occur via the interaction between systems with specific individuals only. The PEAR proposition had initially outlined that anomalous

phenomena could be studied effectively within controlled environments using a rigorous and consistent protocols in following with scientific remits. However, the lack of replication by PEAR and the later consortium does not suggest that this proposition is viable and that influencing and extraneous factors should still be taken into consideration.

2.6. Experimental PK Tasks

Previously, Rhine had established the precedent for using random system based tasks, such as rolling die and cascades (see Section 2.4 for a review of Rhine's work). However, even with automatic die rollers, there was still too many opportunities for accidental human and environmental interference. The PEAR laboratory refined the use of random system PK tasks by using computer programs. Such automated system eliminated extraneous 'noise' and allowed for a clearer representation of results (see Section 2.5). However, although these random PK tasks did much to answer the questions of what tasks to use and why, the question on how the PK tasks impacted was unclear.

However, research exploring arousal and anxiety on PK effects had shown encouraging results (see Section 5.1 for an overview). It was proposed that the competitive PK tasks included within the experimental trials were a causative elements in these successes. The nature of these tasks served to stimulate levels of arousal and anxiousness partly due to the participants being personally invested in the outcome of the task – they wanted to win. These findings prompted the question as to the optimal type of PK task to incorporate within an experimental study should have relevancy for the participant. In this manner, whether they believed in the existence of PK or not, there would still be an underlying motivation towards a successful outcome. After all, we all will the traffic lights to change for us in time or that our numbers will come up on a lottery prize draw.

Therefore, the following section discusses the development of personally involving tasks employed within experimental PK studies.

Steen (1957) explored the use of embedding a PK task within a 'baseball' game in order to disperse possibly detrimental effects caused by too much intention. This game still used dice as the focal target objects – one red and two white – that were rolled and the different combinations of die faces indicated different baseball plays consisting of either actual hits and misses or latent hits and misses. Results observed that there was a higher proportion of actual hits to misses than for the latent hits and misses. A decline effect was also noticed between actual and latent hits throughout the trials. This research by Steen, followed

by similar studies by Ratte (1960) and Ratte & Greene (1960) produced significant findings and was considered the precursor to studies employing a personally relevant and involving task with which to explore PK performance as advocated by Stanford (1977b). However, it must be pointed out that Steen (1957) only used two participants within his study which places his significant findings in a new light.

2.6.1. Game tasks

Schechter et al. (1982) conducted a preliminary experiment using a PK computer game task called 'Psi Ball' connected to an RNG. The game involved the ten participants moving a lever to try and keep a 'ball' away from wall hazards for as long as possible on a computer monitor. Ten RNG events occurred approximately five times every second. If there were less than five hits during this period the sensitivity of the ball in relation to the lever movements was increased throughout the trial, thus increasing the difficulty level. If there were more than five hits the sensitivity was left stable. Participants were not given any direct feedback during the sessions and after completion, they were asked to rate their own concentration on the game. The sessions involved ten five games trials and were split into two conditions of 'RNG-Contingent' (RNG hits affecting the difficulty level) and 'RNG Noncontingent' (not affecting the difficulty level). Both the participants and the researchers remained blind as to the trial conditions until after all the data was collected. A control game without participants was also run every day to double check the performance of the RNG. Prior to beginning the trials, participants completed two self-rated measures on absorption and personality. The researchers only predicted that there would be a significant differences between RNG behaviour during control trials compared to actual trials; and out of personality traits, only extraversion would be significantly correlated with PK hits (low scores indicating high extraversion). Results showed that extraversion was significantly negatively related to PK hits in RNG-Contingent trials ($r = -.58$). There was a significant correlation between attention rating and PK hits ($r = .16$) and were significantly higher for RNG-Contingent than for RNG-Noncontingent. The researchers interpreted this finding as the result from subtle PK feedback from successful performance during the task throughout the increases in difficulty level. Although the participants remained blind as to the involvement of the RNG, the finding suggests that there was an awareness of the increase in difficulty level and a corresponding conscious increase in concentration in order to maintain performance. The result adds to the argument as to whether conscious striving is actually effectual in PK effects as well as for motor-sensory performance processes. However, it appears slightly reticent that the researchers decided to only explore one personality variable at the outset, whilst taking ratings

from a selection. Therefore, the further exploration of other personality and psychological variables in relation to experimental PK effects would be of interest in potential research.

More recently, research by Crandall (1993) exploring the effects of state anxiety and trait extraversion on extrinsic motivation using an automated computer PK task called 'Psi Invaders' with two conditions – relaxed and competitive. Significant results were found only with extraversion within the competitive condition ($r = .32$) and within a further impulsivity subscale ($r = .42$). These findings support previous research that very high motivation and striving only serves to hinder PK performance within relaxed conditions, but is able to be directed and is therefore, a possible asset within a charged atmosphere (Broughton & Perlstrom, 1986; Broughton & Perlstrom, 1992). However, the lack of significance in regards to the relationship between anxiety and PK is disappointing in regards to theories surrounding individual states in RSPK and poltergeist activity.

2.6.2. Computerised tasks

Broughton and Perlstrom (1986) conducted PK-RNG research incorporating a computerised dice game – an initial experiment and a following replication. The use of a competitive game as a task tapped into the participants' motivation to succeed. The participants were required to roll two dice presented on a video screen by pressing a button on a games control. The aim of the task to accrue a higher score than another competitor using the sum of the two dice. The dice were 'rolled' five times, but the generation of double faces resulted in penalization. In fact, the generation of the dice scores were controlled by a true random number generator. The experiment consisted of a repeated measures design, with fifty participants taking part in two versions of the game – 1) that of a non-competitive condition playing against the computer, offered as a 'warm-up' session; 2) a competitive condition where participants believed that they were playing against another person via a telephone interface. The researchers added to the participants' motivation to succeed by stating that the other player was from a rival sports team. To assess anxiety, participants also completed two self-report measures – the Sport Competition Anxiety Test (SCAT) (Martens, 1977) and the State Trait Anxiety Inventory (STAI) (Spielberger, Gorsuch, & Lushene, 1970) immediately prior to the experimental trials. There were no significant PK and competitive effects found within the first experiment. However, it was found that PK performance was negatively correlated with levels of state anxiety prior to the competitive game and the subsequent scores – as levels of anxiety increased, scores decreased, ($r = -.52$). In addition, there was a large negative correlation between participants who practise a mental discipline (such as

meditation) and scores from the competitive game, ($r = -.85$). This led to the conclusion that under competitive situations PK performance would be negatively associated with state anxiety compared to completing the same task under relaxed conditions. Yet, the findings suggest that as subjective anxiety levels were assessed immediately before the trials began, that this anticipatory state is more likely to affect subsequent PK performance rather than an individual experiencing feelings of persistent anxiousness. Furthermore, as this significant negative relationship between anxiousness and performance only occurred in the competitive trials opens up the question as to whether it was the participants' need to attain a specific goal – that of winning – which effected trial performance, (an issue which is discussed in greater detail in section 2.5.3). However, the researchers noted that the results were only obtained using data from the twenty-three participants who returned the completed forms and scales. The researchers acknowledged that completing the necessary forms and scales proved to be a lengthy process for the participants and this was believed to be the main reason for subsequently having to run the analyses with incomplete data from the entire sample size.

Broughton and Perlstrom (1992) conducted a further study using the same methodology with results replicating the significant negative relationship found between levels of anxiousness and performance in the competitive trial. In addition, the same significant negative relationship was also found between participant anxiety and performance in the non-competitive trials. Although these findings can be interpreted as supporting the theory that arousal via feelings of stress or anxiety impact PK performance, it opposes the aspect that they may facilitate PK effects. Rather, the studies by Broughton and Perlstrom (1986; 1992) instead suggest that they hinder performance – as anxiety levels are raised, thus performance is reduced. Yet, the studies only explored levels of immediate anticipatory anxiety and in line with Rogo's theories of PK effects and poltergeist activity (1978; 1980), (presented in section 2.2.3), perhaps it is the impact of long-term chronic anxiety or stress on PK effects which should be considered further.

Further PK work exploring this goal-oriented motivation was conducted by Morris (1982). The design employed a computerised cascade PK task called 'Horizon', which displayed a series of pyramid shapes simulating a reclining panel. The thirty-two participants were asked to try and manipulate the pattern of randomly descending dots to either the right or left side. Half of the participants were instructed to actively strive and the other half to remain passive. Findings showed a significant difference between passive and striving states. The perhaps surprising results showed significance for non-striving, but with striving significantly below chance. However this result provides support to the theory that it is

through moderation of effort and motivation that PK effects are produced. In following Sheldon and Elliot's Self-Concordance Model (1999) outlined in Chapter 2, failure by the individual to achieve a desired goal can have detrimental effects on psychological well-being, thus decreasing levels of motivation and effort in similar endeavours. The immediate feedback employed in the task may have hindered the conative processes involved in the goal-directed striving and the likelihood of PK effects.

2.6.3. Random systems: REG and RNG tasks

Schmidt (1974) noted that PK effects appeared to be independent of the type of random event device employed within experimental sessions with findings using dice and RNG tasks proving similar in magnitude. In order to explore this further, he conducted a series of three PK/RNG experiments in order to empirically compare PK effects using two different levels of randomness – 'simple' and 'complex'. The trials consisted of the choice of RNG level being randomly selected beforehand using a recorded random tape and without either the participant's or researcher's knowledge. Both RNG level devices were located in another room to the participant. During each trial, the participant would concentrate on lighting one of two coloured lamps in the room pre-specified beforehand. Overall, thirty-five participants took part in the series of studies and length of the trials was approximated at one thousand each (including the pilot). The pilot test used 4 participants (including Schmidt). For the first experiment the participants were already selected due to their positive performance in previous PK studies and were also informed of the presence of two different RNG levels. However, in the second experiment, participants were the same, plus members of the test laboratory team; and for the third experiment participants were volunteers from the general public and only the simple RNG level was activated. To answer the initial aim of the investigation of whether there were PK effects under both RNG conditions, Schmidt observed that there were PK effects for both RNG levels, with scores for the 'simple' system being slightly higher, although the difference between these effects failed to achieve statistical significance when analysed using the critical region value (CR). Schmidt defined this as the 'equivalence hypothesis', whereby similar effects are observed within different task conditions which have related sensory input. However, such research opens the door for the present research in also attempting to answer the question as to whether varied randomness levels and individual differences have an impact on PK effects.

Shafer (1982) continued the investigation into the effects of different levels of randomness by conducting a PK experiment using a true random and pseudorandom

generated targets. The procedure involved twenty pre-selected participants and a circular display of 16 lamps, which were successively lit in a clockwise movement. This movement was halted at random intervals on a lit lamp and then continued until sixteen move-halt pairings had been completed. This procedure was also completed in a counter-clockwise manner. In addition, participants were played a tone through headphones for the clockwise movement, but not during counter-clockwise. The halting of the movement was determined by the two random levels. The aim for the participant was to actively control the duration of clockwise movement to as long as possible without halting, and conversely to try and halt the counter-clockwise movement. The length of trials was not standardised as Schafer determined the session duration on the performance of each participant and participants remained blind as to the levels of randomness. However, results failed to achieve significance, although Schafer states that there was a trend for psi-missing effects.

Similarly, dual ESP and PK studies employing a simple task based on a greyhound race (Roe, Davey, & Stevens, 2003a), further advocated the need for a task that participants were actively involved with and was able to generate an investment in the outcome. Using a 2 x 2 repeated measures design, (ESP and PK) x (informed or not informed), 40 participants were asked to take part in a simulated greyhound race, where they were either designated a greyhound (PK condition) or had a choice of a few greyhounds (ESP condition). Participants were also either informed as to which condition they were or kept blind. The PK condition was run using a Live REG, whereas the ESP condition was run using a pseudo REG with some trials to be appearing to be one condition when they were actually in another and vice versa. Additional correlational variables of individual differences were also assessed, including state/trait anxiety. Success was measured as to the amount of virtual money a participant could win, with 1/6 trials achieving above chance expectation. However, even though the nature of the task was both competitive and involving, none of the inferential analyses proved to be significant. There was no significant success rate, or differences between the PK and ESP conditions, informed or not informed. In addition, there were no significant relationships found between these four main variables and the individual differences measures. The researchers conclude that limitations of the study could have included the complexity of the task, drawing on the work of Storm and Thalbourne (2000) and Kennedy (1978). Furthermore, that PK effects were still too unreliable to be able to act as correlates.

Braud and Schroeter (1983) conducted two studies exploring motivational aspect and lability in PK-RNG tasks by eschewing the commonly used feedback of lights, colour

changes and sound in favour of a more personally involving medium. To this end, an oracle-based computer program named 'Algernon' was developed which provided participants with meaningful answers to posed personal questions. Such a method had been previously used by the research team at the Maimonides laboratory with a program named 'Alice'. The Algernon program stored 512 brief statements aimed at corresponding to various life questions and varied in the degrees of ambiguousness, seriousness and humour. The method relied on the pre-preference to an answer the individual may already have when posing a question and therefore, PK effects could be measured by the perceived subjective appropriateness of the answer provided by Algernon. The procedure involved the participants typing their questions directly into the computer, the answers for which was then generated on the screen. Sixteen participants were asked to pose sixteen questions which they then rated for appropriateness. PK effects were gauged by any consistently high ratings of the answers. Incorporating Braud's theory of lability, the hypothesis stated that high levels of lability or randomness would be more susceptible to PK than low levels of lability. Therefore, four different levels of randomness were used in order to generate 'Algernon's' answers – true RNG; pseudo RNG; pseudorandom-single RNG; table RNG). Participants were randomly assigned to the RNG lability conditions and both they and the researchers remained blind to the RNG condition until data had been collected. Although findings showed that the predicted order of mean ratings for the four different conditions held (descending from true RNG down to table RNG), significance for PK effects was not achieved, with participants expressing their dissatisfaction after trial completion that their desired oracular statement was not presented. Regardless of the lack of significance of the statistical results, the use of such a personally involving PK task had opened the door for a fresh and innovative approach to experimental PK-RNG design.

Gissurarson and Morris (1991), whilst conducting a series of PK studies proposed the re-use of the term 'conation' in defining the consciously controlled effort of striving towards a desired goal. The studies explored the use of conative strategies on behaviour by using another computer generated PK-RNG task with conditions involving feedback and non-feedback. Their first experiment explored the use of a specific time interval in which participants willed PK effect and which found some significant results between trial time intervals ($r = .72$). Further significance was obtained with assigned conative strategies of using process-oriented imagery; goal-oriented imagery; and end-oriented imagery. The experiment concluded that different strategies to PK effort result in differing time intervals

with which to strive for successful PK effects, offering further promising research possibilities.

An interesting addition to studies using either REG or RNG materials was conducted by Blasband (2000) who ran an REG (with permission) during Reichian bio-psychiatry sessions with individuals and observed deviations from chance during periods of obvious heightened emotion - both positive and negative - which is suggestive for theories pertaining to PK activity stemming from an integral emotional source. However, it must also be pointed out that it is unclear as to whether moderate aspects of negative emotional expression such as boredom and just being in a 'bad mood' also have an impact as results so far have proved to be inconclusive (von Lucadou, Lay, & Kunzmann, 1987). In an attempt to trigger specific emotional responses in a controlled environment various methods have been employed, including visual imagery (Gross & Levenson, 1995) and descriptive scenarios, but a preferred and altogether more reliable instrument has been the use of music by Lumsden-Cook (2005). This experiment supported the effects of polarised state emotional arousal and dissipation (anger and happiness) on REG activity, but also served to bring into question whether such activity had a corresponding direction in regards to particular emotions. However, such studies still are unable to answer whether PK effects can be isolated to the individual participants, or whether extraneous influences such as experimenter effects or environment factors also have a bearing.

2.6.4. The I Ching task

These personally involving PK tasks tended to remain game-like or with a competitive element. However, the oracular computer programs of Algernon and Alice were precursors to a new form of task when Rubin and Honorton (1971) adapted the concept of the ancient divinatory method of the I Ching as an experimental task when exploring psi effects. The I Ching or 'Book of Changes' is compiled from sixty-four distinctive hexagrams (made with six lines) which give a divinatory reading. Traditionally, the readings are inscribed on yarrow stalks and when the enquirer asks a question, these are shaken and thrown on the ground resulting in the given divinatory answer, although in modern times often a coin method is favoured instead of yarrow stalks. The I Ching not only offers participants a personally engaging task, but it also meets the prerequisite of randomness for PK experiments. A sample of forty participants generated a hexagram by tossing 6 coins from a cup whilst concentrating on a meaningful question and were given two readings – a control and the actual one – which they were then asked to rate for accuracy on a scale of one to ten. Findings failed to show any

significance on the ratings. However, the use of this novel psi task acted as precursor to following studies intent on exploring PK through random systems. Honorton and Barksdale (1972), explored the effects of arousal and relaxation on PK performance using three sequential PK-RNG studies. In these studies the participants were asked to influence the RNG over a series of 1280 trials. The first and third studies observed a significant difference between the aroused and relaxed state and that a state of muscular tension (equated with arousal) facilitated PK performance. However, a note of caution must be added, as firstly, the studies used very small sample sizes, with the first experiment using only six participants, the second had ten participants and the third just one participant – Honorton himself. In fact, Honorton attributed all of the successful psi-hits within the first and third experiments to his own influence, explaining that the non-significant results of the second experiment was due to his lack of presence. Secondly, the researchers asked the participants to exhibit muscular tension, but without any immediate measure to assess the effects of such tension on their physiological state.

Thalbourne et al. (Thalbourne, Delin, Barlow, & Steen, 1992-1993) attempted to replicate the experiment with fifty-three participants and using the same hexagram rating method, but with additional factor of delayed feedback (one week). Although, on average the real reading was rated as being more relevant than the control reading the experiment again failed to find any significant differences. The researches acknowledged that the methodology was flawed, due to the researchers generating the control and real readings post hoc to the I Ching session and the trust involved during the week of delayed feedback, where the participants were trusted not to look up their own readings. However, such findings were not considered detrimental to the involvement of the I Ching as a robust task in psi research.

Therefore, Storm and Thalbourne (1998-1999) continued to use the I Ching task in a later experiment investigating psi and transliminality. In order to obtain a reading to a meaningful question the enquirer throws three coins, six times. For their experiment, the researchers asked participants to choose sixteen hexagrams deemed relevant to the pre-specified statement beginning, ‘Lately, or right now, I feel...’ The choice of hexagrams was generated using the Hexagram Descriptor Form (HDF) devised by the researchers. With a sample size of ninety-three, the experiment hypothesised that there would be significant psi-hits if 1 in 16 of the chosen hexagrams was produced by the I Ching, and post hoc amendments to the statistical analysis did find significant effect sizes, $\pi = .59$, $p = .05$. Yet, it

was difficult to conclude whether the findings represented PK effects (with participants influencing the choice of hexagram) or as precognition (participants knowing the choice in advance). Indeed, Storm and Thalbourne built on this research further by incorporating the I Ching task (and included 64 two-word descriptors of the hexagram readings for ease of use), within studies ostensibly investigating PK effects. A further replication was conducted in order to confirm these past findings and the shared primary hypothesis that the psi-hitting rate would be greater than MCE when expressed as a proportion of hits, ($P_{MCE} = .25$; binomial test) with a chance effect size greater than $\pi_{MCE} = .50$. With a sample size of one hundred and seven the procedure required participants to again choose sixteen hexagram descriptors from the total sixty-four that they felt were relevant to their feelings using the original statement of ‘Lately, or right now, I feel...’. Participants threw the three coins, six times with one of the researchers recording the number of heads and tails which were then converted into hexagram lines. However, the participants did not rate the generated hexagrams. A psi-hit was judged by this generated hexagram to one of the sixteen hexagram choices made by the participant. Results showed that the primary hypothesis was supported, $P_{MCE} = .35$, $p = .02$ and with chance effect size $\pi_{MCE} = .61$. The researchers conclude that findings from the replication support evidence of psi effects, although it still remained debateable as to whether the effects could be attributed to either PK or ESP or indeed, both, with the researchers favouring the view of psi as a unitary phenomenon. A query raised following publication of this experiment was in relation to intentional manipulation by the participants of the fall of the coins and unintentional weight bias of the coins themselves. Although defended by Storm and his colleagues, the query did raise the question of how better to adapt the apparatus to eliminate any unwanted factors. Storm and Thalbourne continued to use the I Ching task within replication studies (2001a; 2001b) exploring personality variables, boundary thinness and transliminality with the successful outcomes explained as being due to ‘psychopraxia’, a theory developed by the researchers in order to understand the ESP-PK dichotomy which is:

“...the self bringing about goals in the mind-body complex or in the wider world.”
(Storm & Thalbourne, 2001a, p. 117)

In addition, following the aggregation of data from a series of studies using the I Ching, Storm (2002; 2003) later suggested that the underlying principal of the I Ching process is inherently paranormal in nature:

‘...the implication that the structure of the system is somehow attuned to certain individuals.’ (Storm, 2003, p. 79)

Furthermore, that occurrences by chance alone are still susceptible to intention by individuals, either conscious or unconsciously. Therefore, such an intention on the I Ching process may produce a relevant reading via psi effects. Storm (2003) explored the psychopraxic element of ‘goal orientation’ in relation to the I Ching task, hypothesising that the process would be shown to be ‘non-cybernetic’ or occurring without information processing shown to be within other cognitive functions such as perception. This hypothesis is supported by Kennedy (1995), who proposed that psi effects are a teleological process in that they are attuned towards a goal and also by Stanford’s Conformance Behaviour Model (CBM) (1978) which proposes that psi may not involve information processing. However, this goal may either be the goal as an outcome or as a fulfilment of an individual’s intentions. Using the data accrued from the previous I Ching research (Storm & Thalbourne, 1998-1999; 2001a), Storm compared the hit-rate of the two samples which had used two different forms of descriptions or the hexagram divinations. The result remained inconclusive, showing neither a cybernetic or non-cybernetic effect for the I Ching process. Storm concluded that the psi processes may only exhibit in a manner that suggests goal-orientation with the possibility of additional mediating information too subtle to be detected.

2.6.5. The next generation: PK-RNG effects using an I Ching task

Building on additional research by Storm and Thalbourne (1998-1999) employing the I Ching as a PK task, currently, the majority of promising research dedicated to exploring these identified aspects of PK performance within the laboratory environment has been conducted by Roe and colleagues. However, in following this line of enquiry methodological flaws were identified in the manual nature of the task and in the outcome selection process and improved upon by employing an automated I Ching RNG program and Q methodology as a reliable rating system (based upon a normal distribution structure), (Martin, Drennan, & Roe, 2010). The great advances in modern technology have allowed for such automated procedures and managed to eliminate possible bias caused by manual interference – an ambition only previously conjectured by Honorton and Tremmel (1980) with their development of psi-conductive interactive computer software called ‘Psitrek’. Varvoglis (1988) explored the potential of research with automated computer RNGs further by taking studies into a real-world environment, although results proved to be inconclusive.

More recent attempts to replicate these findings (using a larger sample size) have not found similar significance between states of high and low arousal for PK. Taking their cue from this battery of studies, Roe et al. (Roe, Davey, & Stevens, 2003a; 2004; 2005; 2006)

conducted a series of standardised studies exploring the effects of different factors on both ESP and PK performance, with the third in the line of studies concerned with the impact of arousal (2004). Prior research considering ESP and PK as separate dimensions of psi had given contradictory findings concerning the levels of arousal indicated for effects – with high levels of arousal attributed to PK and low levels for ESP (Braud, 1981). With experimental research into ESP and PK tending to use different methodologies, the researchers noted that in order to experiment both psi aspects simultaneously a common protocol must be included. Therefore, a computer-based task of a greyhound racing program was developed. To explore PK effects, the program was run using two levels of randomness – that of a true RNG and that of a pseudorandom paradigm. The two previous studies had the target and control greyhound run using different levels of randomness. However, following reflection on inconsistent results, the researchers decided to alter the format by enabling the target and the control greyhound to be run using the same randomness level. To prompt a relaxed and aroused state a choice of classical music was employed for each condition. Results using a sample size of forty participants (20 in each condition) showed that in contradiction to previous research, participants in a relaxed state performed better during the PK task, but not significantly so, failing to support previous findings, (Braud, 1985; Honorton & Barksdale, 1972). However, it must be emphasized that a limitation of this particular experiment was the omission of physiological measurement with which to accurately assess arousal. This made it unclear as to whether the participants within each condition did deviate from their own baseline natural state. Indeed, this discrepancy is acknowledged by the researchers, who recommended that the inclusion of such a measurement tool is included within future studies. Another in their series of studies using a PK task of a greyhound racing game also considered the role of anxiety within experimental performance. Findings showed that although higher levels of anxiety were detrimental to performance, a medium sized relationship existed between state/trait anxiety and PK performance ($r = .25$). These results are encouraging as they are similar to conclusions derived from earlier investigations (Broughton & Perlstrom, 1986; 1992).

A recent experiment by Roe et al. (Roe, Martin, & Drennan, 2010), offered a simple, but acceptable PK-RNG protocol using the I Ching task which has been adapted for use in the current studies. The I Ching program involved three separate RNG liability levels of Table (low), Pseudo (medium) and Live (high). The experiment incorporated a Q sort grid in order for participants to rank their readings from -7 (least appropriate or accurate) to +7 (most appropriate or accurate). Rating the readings for accuracy was deemed to be a much more effective method than that of the HDF devised by Storm and Thalbourne in previous

experiments (1998-1999). Building on existing data from thirty-three participants, the data from an additional seventeen participants was collected increasing the sample size to fifty. The initial protocol template of a computer-based I Ching computer task was adapted to simulate Storm and Thalbourne's coin tossing method (Thalbourne, Delin, Barlow, & Steen, 1992-1993; Storm & Thalbourne, 2001a). Individual lability was assessed using the sum of scores from four individual measures concerned with creativity, neurological processes, and openness to experience. Three levels of individual lability (low, medium, high) were gained by dividing the overall scores. Following completion of the four measures participants were asked to think of a personally meaningful question (not to be shared with the researcher) and were introduced to a Q sort grid and were asked to rate the 64 I Ching readings by placing the relevant descriptor cards on the grid. Once the grid had been satisfactorily completed the participants were introduced to the I Ching computer program. They were again asked to concentrate on their personal question and press the space bar to generate the hexagram reading. Participants were required to generate three hexagrams in order to involve the three levels of RNG lability source. Once the task was finalised and the participant debriefed, the researcher recorded the ratings from the Q sort grid and the hexagram values from the I Ching program. Although the general pattern of performance was in line with prediction, with the highest average ratings awarded to hexagrams selected by the most labile Live method, next highest for the moderately labile Pseudo method and worst ratings for the most stabile Table method, the mean shifts were small and non-significant, $F(2,58) = .571, p = .57$. Similarly, although the highest overall performance was achieved by the most labile participant group, an intermediate level of performance was recorded by the intermediate group and worst performance was by the stabile group, the modest differences were not significant, $F(2,29) = .099, p = .91$). Therefore, despite the pattern of performance being superficially similar to that reported in previous studies, this experiment was not able to replicate the interaction between participant and target system lability, $F(4,58) = .896, p = .47$). Possible causes for this failure to replicate are considered, including that the original studies' findings reflect Type I errors and that the sampling method was insufficiently sensitive to belief and expectancy factors. Suggestions were made for future research, particularly with respect to identifying variables that might have contributed to the unexpectedly large variance in scores due to 'error'.

2.6.6. RNG methodology findings

A recent meta-analysis conducted by Holger, Steinkamp and Boller (2006) on three hundred and eighty studies concerning PK effects mediated by the interaction between individuals and RNGs found that there was a significant, yet relatively small effect size

overall, thus showing how necessary it is in parapsychological studies to accrue large sample sizes. Conversely, it was also able to show how inconsistent previous meta-analyses exploring previous dice and PK-RNG studies had been - ignoring exclusion criteria; moderating variables; different levels of RNG randomness; and using simple rather than weighted means to gauge effect sizes (Radin & Nelson, 1989; Radin & Ferrari, 1991).

Methodology using PK tasks involving random number generators (RNGs) has observed significant results and a potential for desired repeatability. The above section has reviewed the introduction of automated computer RNG programs and how they have helped to eliminate the extraneous variable of personal and manual bias. Furthermore, the nature of the assigned PK task has been explored in relation to producing viable PK effects, concluding that a standard requirement should be that it has personal relevancy to individuals, so that they have an invested interest in the outcome.

In following this line of PK-RNG research employing an intrinsic PK task that can stimulate personal interest, the next section outlines the standardised methodology of the three empirical PK-RNG studies included in the present research. Based on the previous research of Storm and Thalbourne (1998-1999; 2001a; 2002), Holt and Roe (Holt & Roe, 2006; Roe & Holt, 2006), the studies utilize a PK task involving I Ching divinatory hexagrams produced by three different levels of RNG lability sources and rated by participants on a Q-sort table.

2.7. Q Methodology

Previous research employing the I Ching as a task evolved the initial simple ratings system to include the Q sort methodology (Martin, Drennan, & Roe, 2010). Q methodology was developed by William Stephenson in 1935 as a means to measure subjective individual experiences based on the factor analysis process (Brown, 1993). Key to the Q methodology is that the subjective aspect of the analysis is not compromised by the own attitudes of the researcher (McKeown & Thomas, 1988). The method enables subjective views to be analysed quantitatively and in a practical manner and allow for a broader perspective to the relevant research topic. The initial step within Q methodology is to develop a set of statements or Q-statements either from an existing pool or developed naturalistically. These statements are used to provide the communicated subjectivity of the research topic. In relation to the previous PK-RNG studies, this Q-sample is comprised of the 64 divinatory I Ching readings (See Appendix A.5, Figure 1.19). Overall, these readings, translated into English, are necessarily ambiguous and easily transferable as answers to a multitude of given questions. For the purposes of the sequential experimental studies in this research, a Q sort table was

chosen as the integral rating system for participants to rate the 64 hexagrams of the I Ching as it is a completely subjective research tool. For the Q sort table used in the experiment the rating spectrum consisted of ‘least appropriate or accurate’ through to ‘most appropriate or accurate’ (See Appendix A.5, Figure 1.20).

2.7.1. Contextual factors: The relationship between the participant and the researcher

Throughout even the very early Victorian psi experiments by researchers such as Gurney, Myers and Podmore (1886) it was noticeable that direct observation by either researchers or strangers would negatively impact on findings. This pattern was observed in a series of later PK experiments conducted by Rhine and Gibson (Gibson, Gibson, & Rhine, 1943), involving identifying consistent patterns when rolling dice. The studies were conducted using two of the experimenters taking alternate roles as both participant and experimenter. When L. H. Gibson was the participant, PK score levels dropped considerably when she was aware of being under direct observation. Yet, in contrast, when E. P. Gibson participated, his scores increased when he was aware of being observed. These fluctuations between scores for the different experimenters within both roles are interesting as they highlight potential extraneous factors that could also have impacted on PK effects within these studies. In this instance, the awareness of being observed, gender differences and also how the participant and experimenter interacted during the session and how they perceived each other are also aspects that need to be considered in relation to experimental performance. Rhine was firm in his belief that it was the duty of the individual experimenters who were interacting with the participants to inspire enthusiasm and motivation in them in order to produce psi effects. Therefore, their demeanour was critical to the experimental methodology (Rhine, 1944; 1948).

Furthering this speculation into how inter-personal factors could affect experimental psi performance, Kennedy and Taddonio (1976) have distinguished psi experimenter effects as being a separate aspect to known psychological experimenter effects and define them as being:

“...unintentional psi which affects experimental outcomes in ways that are directly related to the experimenter's needs, wishes, expectancies, or moods.” (p. 5)

Based on the early suggestions of Rhine (1948), Kennedy and Taddonio (1976) distinguish two main factors from which positive experimental psi performance may result – those of enthusiasm by the experimenter and also a friendly and warm interaction between the experimenter and the participant. These factors would also determine whether or not an experimenter was deemed an asset for the production of psi effects or indeed a hindrance. Yet, it was also proposed that an individual experimenter would likely already have these innate attributes or the ‘knack’ of developing a stimulating interaction with participants. Unfortunately, it was also suggested that these inter-personal factors could not be learned, appropriately, thus, potentially relegating some parapsychological researchers to a career of consistently unsuccessful results.

More recent PK research exploring the participant/researcher interaction was conducted by Roe, Davey and Stevens (2006) which has formed the basis for the present research. This prior research into participant/researcher interaction has used various procedures in which to explore such effects, including measures of personality, confidence in a positive psi outcome, personal experience of psi (Smith, 2003); physiological measurement of electrodermal activity (EDA) (Schlitz, Wiseman, Watt, & Radin, 2006); previous research outcomes for the individual experimenters (Parker, 1974; 1976) and interaction questionnaires (Sherwood, Roe, Holt, & Wilson, 2005). Within the field of parapsychology it has been recognized (perhaps controversially) from actual research findings or from a personal revelation that certain researchers are deemed to be either psi conducive – whereby outcomes are significant towards the production of psi effects - or psi inhibitory – where psi effects are not manifested. Not only could other individuals determine whether or not psi findings were significant, but also the directionality of the outcome.

Storm and Thalbourne (2005) developed a theory of ‘psychopraxia’ in an attempt to better understand the dichotomy of ESP-PK phenomena. The theory is comprised of four elements relating to both internal and external actions: 1) That the self is the co-agent of this action; 2) that there is a ‘pro-attitude’; that there is a ‘goal-state’; 4) that there are mediating conditions affecting these previous three elements. In relation to investigating the impact of this ‘pro-attitude’ the researchers conducted which attempted to manipulate sceptics into actively gaining psi-missing hits. Using a repeated measures design, sceptical participants were asked to identify a group of symbols randomly presented on a computer. After the first trial the sceptical participants were informed that if they scored either too high or too low, this would be evidential of psi effects. In this manner, the researchers aimed to encourage the sceptics to try and score at chance, rather than above or below. Subsequent significant

correlations were found between the hit-rate and levels of belief in psi post information, but not prior to, in sceptical participants defined as having been ‘converted’ to a belief in psi effects. The researchers interpreted these findings as showing support of how ‘pro-attitude’ can change within an experimental study following feedback and consequently potentially influence results. These findings offer support as to the impact of the participant’s perception of the researcher’s attitude towards the outcome of a parapsychological study, as opposed to their own beliefs. Suggesting that a motivated researcher would necessarily influence even the most hardened of sceptics when testing for psi effects, albeit for either psi-hitting or psi-missing results. In addition, Thalbourne (2004) proposed this ‘pro-attitude’ in addition to the individual and other mediating factors is critical to creating the optimal conditions for psi effects.

To muddy the waters further, it was suggested quite early on by White (1976) that persons who may also be involved in the experimental procedure or within proximity to the environment other than the actual researcher could have an unconscious impact on psi findings – including technicians, research assistants and even those inputting data. Furthermore, these include persons who are not directly involved within the actual experimental environment. This suggestion only appears to reiterate the elusive nature of PK phenomena and the inability of researchers (thus far) being able to confidently assert that it is central to an individual.

Although it may be presumed that researchers may be unconsciously influencing the actual PK outcome, Schmeidler (1997) has also proposed that individual researchers may be temporarily transferring an innate PK ability to the participants during the experimental procedure. It could also be theorized that PK effects may only materialize following an inadvertent unconscious collaboration between individuals, such as those to be found within ‘sitter’ groups.

2.7.2. Group sitter PK: The contribution of Batcheldor

In line with this proposition is the work of Batcheldor with séance-like group sitter sessions as an attempt to produce PK effects (1984). Batcheldor identified a triad of specific requirements for either the success or failure in the elicitation of PK effects, Belief, Ownership resistance and Witness inhibition: 1) All persons the group environment must have a belief in a successful outcome; 2) that individuals must acknowledge ownership of PK effects; 3) that individuals in the environment should not feel disturbed by PK effects (Heath, 2003). To address these requirements, the Batcheldor technique involved an initial fake PK

occurrence, in order to establish belief of PK effects within the group. By employing a group of individuals during a session mitigated any exposure of a single individual being responsible for any subsequent PK phenomena. In addition, Batcheldor introduced an element of fun and laughter into the sessions to make the sessions feel informal and thus, eliminating any inhibitions. This latter technique is very reminiscent of the suggestion by Rhine (1948) and Kennedy and Taddonio (1976), that PK sessions need to be conducted by friendly and warm researchers in order to generate a more conducive atmosphere and which is taken consideration within the current research. The PK effects noted within these group sittings included table tilting and levitation and rapping noises, similar to those within Spiritualism séance situations (Batcheldor, 1984). In his approach to researching PK effects Batcheldor was aware of the potential manipulations of fraud, self-deception and unconscious muscular activity, but employed a range of systems, such as motion detectors and electric circuits to control for such unwanted effects during over two-hundred sessions. He concluded that there was some form of anomalous event occurring during these sittings that could not be explained by other means. Batcheldor's work exploring group situations mirrors the suggestions by Rogo (1980) that intrapersonal dynamics can contribute to the production of PK effects. However, the differentiation being that the results of Batcheldor suggests a conscious knowledge of effects being produced, whereby Rogo proposed that effects are via unconscious processes.

In an attempt to understand why results with certain researchers are significant, but yet are unable to be replicated by the same participants in exactly the same experiments, only with different researchers, Wiseman and Schlitz (1997; 1999) acted as researchers on the premise that each of them described themselves as being either psi-conductive (Schlitz) or a psi-inhibitor (Wiseman). The initial study and further replication explored the effects of remote staring whereby each of the researchers conducted the studies under the same conditions. For both studies it was found that findings under Wiseman were not significant, but that under Schlitz they were. The subsequent discussion stated that the likelihood of confounding factors such as cheating, fraud and even the use of only 'gifted' participants by Schlitz was improbable. With the researchers known for their individual views on parapsychological phenomena well known within the field – Wiseman as a pronounced sceptic and Schlitz a definite advocate, the outcome supports the theory that unknown individual characteristics of both the researchers caused an effect. Yet, this 'psi-conductive' label given to researchers relies on the outcomes from previous studies which are deemed

consistent either through significant or non-significant results. Therefore, it is hard to determine whether other researchers with less experience in conducting active studies with participants are able to be defined in this way. Moreover, it is still open to debate as to whether such effects would be classified as being parapsychological in nature – the researcher is inadvertently using their own latent psi ability – or psychological.

Indeed, many could still argue that the influence of other individuals on the outcome of an experiment could be purely down to psychological factors rather than any parapsychological phenomena. Kennedy and Taddonio (1976) state that a point should be made to distinguish effects that may be caused by each of these two variables.

2.7.3. Decision Augmentation Theory (DAT)

Decision Augmentation Theory (DAT) proposes that information from anomalous cognition is included within normal information processing in order to reach an unconsciously desired decision or outcome (May, Utts, & Spottiswoode, 1995; May, Spottiswoode, Utts, & James, 1995). Experimental PK research involves two main protocols in order to gauge effects, that of 1) completely isolating the target system and 2) counterbalancing the target system with periods of control and effort. However, regardless of these two necessities, individual and environmental factors would always still have to be taken into consideration within the resulting outcome. Experimental situations will have been influenced by individual decisions prior to, during and post-trial sessions which DAT proposes to take into consideration. Viewed in the light of the slight statistical deviations apparent within experimental PK research, May and colleagues suggested that micro-PK (referred to as ‘anomalous perturbation’ or ‘micro-AP’) could be statistically calculated using an algorithm for both prospective and retrospective PK-RNG research. May et al. (May, Utts, & Spottiswoode, 1995) considered Stanford’s PMIR model (1974a; 1974b) as comparative to the DAT, as the individual is able to make sense of their environment and the demands using both anomalous and known information processing. However, this proposition, based on systematic information processing is in direct contrast to Stanford’s later cybernetic model of psi and the CBM (1978) which theorised that anomalous processes are isolated from known information and motor-sensory systems. Interestingly, when applying their DAT algorithm to both existing and prospective PK-RNG results, May et al. (May, Spottiswoode, Utts, & James, 1995) concluded that PK should not be considered as a force, but rather as an influencing factor. Furthermore, in formulating DAT, May and colleagues suggest that there is no actual basis for experimental micro-PK effects due to the sheer volume of potential

artifices from individual and environmental factors. However, they do propose that there is a case for a singular phenomenon combining micro-PK and precognition that is based on information acquisition.

2.7.4. Influence of individual differences

Early research at Duke University by Rhine (1948) studying the impact of individual differences, stated that significant results would more likely be attained by researchers who scored highly in such psychological aspects of extraversion, sensitivity and sociability. However, results still remained inconclusive with no significant differences found in psychological aspects between psi-conducive and psi-inhibitory researchers, although a trend for a certain amount of self-assertiveness was found in post-hoc analysis. In a publication outlining psi research, Rhine and his colleagues advocated the need for the psi investigator to be enthusiastic, interested and, above all, motivated, in order to elicit the best results from participants (Rhine, Pratt, Stuart, Smith, & Greenwood, 1940):

“All the skills and methods that can be devised by the experimenter for conveying encouragement, inspiring confidence, implanting a realization of the importance of the tests, and arousing and maintaining an ambition to perform well in the tests will be decidedly to the point,” (p. 341)

As reviewed by Smith (2003a) these psychological variables include the attitude of the researcher towards participants, plus the unspoken aspects of genuine experimenter error and manipulating findings or data for fraudulent purposes. Additional research by Smith (2003) exploring experimenter effects accumulated data from fifty active researchers in parapsychology regarding ratings of subjective temperament, their own attitudes and belief towards psi and whether they had ever had any personal psi experiences. They were also asked to rate all of the fifty named researchers involved as to whether they would identify each as being either psi-conducive or psi-inhibitory. As described by Hayes (1994) a psi-conducive researcher is defined when research participants achieve significant psi scores when performing in their experiments, without fraudulent means, but not with other researchers; psi-permissive researchers appear to facilitate psi in their participants; psi-inhibitory researchers appear to prevent psi manifesting in participants. Results indicated that there were moderate significant positive relationships found between belief in the existence of PK and psi-conduciveness ($r = .37, p < 0.05$) and a strong positive relationship also with belief in the individual researchers' own PK ability ($r = .61, p < .0005$). In fact, this positive relationship for psi-conduciveness and both the belief in and experience of psi phenomena held true

throughout. This outcome implies that a positive attitude towards psi phenomena by the researcher is a factor in the occurrence of psi-conduciveness within experimental studies. Interestingly, as only information from researchers was gathered, it is unclear whether that psi-conduciveness may be observable within studies where a researcher has a subjective positive attitude towards psi that may or may not be perceived by the actual participants involved.

It appears that this perception by the individual participants is important within psi research. A study conducted by Schmeidler and Maher (1981a) in which participants judged researchers' characteristics based on a viewed recording of their presentations at a parapsychology conference found that those classed as psi-conductive were rated highly in positive aspects such as enthusiasm, warmth and being unassuming. In contrast, psi-inhibitors were judged negatively as being more egotistical in their attitude.

Thouless (1972) suggested that if an individual observes a participant for a limited period during an experimental procedure, findings can begin to deteriorate- possibly due to the lack of immediate activity. However, if the observer is allowed to attend for a longer duration or for the whole procedure, the observer becomes habituated to their presence and scores can respond accordingly back to a positive trend. However, if the observer is perceived to be 'hostile' by the participant, this can have a detrimental effect on psi outcomes –

“...whether this hostility must be overtly expressed to be effective, or whether a concealed hostility also inhibits the phenomena.” (p. 114)

However, as identified by Palmer (1986) whilst reviewing psi research, an obstacle in ascertaining experimenter effects in regards to their attitude towards psi is how they are either bracketed into either sceptics/non-believers/'goats' or as proponents/believers/'sheep'. Following past research, many parapsychologists are known by reputation as falling into either of these two categories and are consequently referred to as such (and indeed, by themselves) within the literature (Henry, 2005). In fact, researcher Susan Blackmore has publically discussed at length her belief that being a psi inhibitory experimenter is a primary factor for her lack of significant findings in her own psi research (1982; 1985). She states that at the beginning of her research career she was infused with confidence that she would find significant results and approached her ESP experiments with enthusiasm. The continuing lack of success, however, caused her to view each potential experimental outcome with pessimism which then gradually morphed into scepticism. Blackmore lists five consequences for the development of scepticism in a parapsychological researcher:- 1) to acknowledge the

existence of psi but attribute lack of experimental success to extraneous variables; 2) acknowledge that the occurrence of psi in a laboratory environment is too elusive for continuing study; 3) become sceptical of the actual existence of psi; 4) acknowledge that parapsychological phenomena does exist, but without the occurrence of psi; 5) become disinterested in parapsychology and related research (Blackmore, 1982). Although she states that the first four consequences should be supported by fellow researchers (but not the fifth), she reasons that the presence of scepticism within parapsychological research should be welcomed as a benefit – by offering the often ignored counter-argument of whether psi exists. To date, no significant psi experiment has been able to conclusively validate the existence of psi, and conversely, all the non-significant results have also not served to dismiss interest in psi phenomena. With psi research commonly favouring a process-orientated approach, Blackmore offers that perhaps research should consider the same from a sceptical point of view – that psi does not exist coupled with how and why people report such phenomena. In her summary of the prospects of psi-inhibitory experimenters, she briefly suggests that in PK experiments the initial perception of success by participants (whether correct or not), convinces individuals that they have psi abilities, regardless of further non-successful attempts.

However, it must also be noted that in his critical examination of Blackmore's psi experiments Berger (1989) vociferously condemns this admission by Blackmore as being completely unsubstantiated, based solely on the outcomes of her own studies and is basically a poor excuse for her inconsistent and 'haphazard' research. To insert a note of caution at this point, perhaps if any lessons can be learnt from the study of parapsychology, it is that it is useless to restrict individual characteristics into such neat black and white categories. Rather, beliefs in various aspects of parapsychological phenomena should be seen on a spectrum. For example, an individual who believes in psi as a contributing factor of anomalous phenomena may not believe in ghosts, and yet may be classified as either being a proponent or sceptic, depending on the nature of the parapsychological aspect being investigated. In later writings, Palmer proposes that such belief systems be separated into belief of psi in the abstract, belief in psi occurrence within the actual experiment and the belief of the individual participant having their own psi abilities (Palmer, 1971; 1972). The failing point of this previous research is that it was primarily concerned with the contributing factors of Extra Sensory Perception (ESP) the other branch of psi, rather than of PK. This is problematic when in regards to reviewing optimal conditions of PK manifestation, as it appears from theorising and previous research that the processes involved within ESP may actually be in direct opposition to those

involved in PK. Furthermore, there it is theorised that aspects of micro-PK investigated by experimental methods are similar to those of ESP. As there is a limited amount of specific PK research resources, this assumption - that results from ESP research can be converted to converse hypotheses for PK is obtuse. Theories regarding PK are controversial as Palmer asserts within his review, stating that researchers are unable to confirm whether there is an optimal state for an individual to attain to achieve PK effects within testing as differences within individual processes and preferences are apparent.

In addition, the attitude of the researcher within the experimental environment has the potential to skew the perception of the participant of their overall appearance. Any biased perceptions that scientific researchers 'should be' male and within an older age bracket are challenged by the current researcher being female and within a mid-age bracket. This form of bias has only tentatively been acknowledged within previous research, for example inclusion of gender was suggested by Smith (2003), but strangely, associations were not subsequently investigated within the statistical findings.

2.7.5. Intention and goal-directed striving

From the early PK effect testing involving the roll of dice conducted by the Rhines have included investigations into the role of striving, with participants allowed to 'wish' for which dice faces should fall (Rhine & Rhine, 1943). This deliberate intention within experimental conditions only mimics the natural tendency of individuals to try and influence external events. How many of us, (including even those sceptical of paranormal phenomena), have focused on willing a set of traffic lights to change in our favour or have actively willed specific athletes to achieve success in competitive events? Furthermore, how many of us secretly believe that they have actively managed to influence such events? It is this effort to possibly exert mind over matter that is interesting to PK researchers – a function that may be either conscious or unconscious.

As defined by Sheldon and Elliot (1999) in their Self-Concordance Model, goal-directed striving is defined as an individual deliberately directing resources in order to attain a specific goal. The processes involved in such direction are described as being conative, that is they are employed to specifically attain goals that meet an individual's needs, and which are distinct from either cognitive or emotional processes (Emmons, 1986). The model proposes that self-concordance is the degree of motivation and effort involved in the temporal striving process, specifically towards a goal which has personal value to the individual (as opposed to receiving either a punishment or a reward). The attainment or failure to reach that goal

throughout the process would necessarily impact on the individual's psychological well-being. As such, in relation to the impact of intentional striving in attaining PK effects the Self-Concordance Model (Sheldon & Elliot, 1999) is of particular interest to the current study as it begins at the point of decision by the individual to strive (rather than before or during making the decision).

2.7.6. Human intention

Nelson et al. (Nelson, Dunne, & Jahn, 1983) explored the effects of human intention on a random mechanical cascade device. Based on previous research using computerised random events generators (REG) and random number generators (RNGs), the researchers were interested to see whether PK effects would be produced on a mechanism of a larger scale. To that end, they developed a large cascade (10 foot by 6 foot with a Plexiglas frontage) based on a Gaussian distribution analogue whereby an amount of balls drop down through an array of pins to collecting bins in order to observe a quasi-normal distribution – the experimental cascade used 9000 balls. To verify the amount of collected balls, the bin were attached to an electronic counter which recorded the sequence and total numbers on a computer. The eleven participants were asked to try and influence the fall of the balls either to the left or the right of the cascade for a three run session – trial 1 right to left; trial 2 left to baseline; trial 3 right to baseline. At the time of publication, the experiment was still ongoing, but the preliminary findings were showing significant deviations. Whilst evaluating empirical PK research, Schmeidler (1990) offers further insight into the final findings a few years after the investigation was completed. Results for the aggregated data from the three trials apparently showed that there were significant differences in between deviations to the right and left trials and also between left and baseline trials. In discussing the results, the researchers had allowed the participants to use their own strategies and state that the findings had shown distinctive progressive deviation patterns for each participant. Although the researchers were not forthcoming of the possible causes for these subjective patterns, it is suggestive that there are definite individual differences influencing PK effects.

2.7.7. Unconscious will

Following the results of PK studies exploring the impact of goal-directed striving, whereby it was shown to detrimental to trial performance, it has been suggested that it is the unconscious will of an individual that acts as the precursor to PK effects. Green and Green (1977, pp. 31-32), theorise that a state of “passive volition” or an inherent wish for success rather than an active will, is necessary for superior psi performance. Therefore, PK occurs via

a suggestion of focus rather than by direct communication shown through striving. In line with thoughts by Braude (1979), this theory of ambivalence is reliant on an unknown cognitive or physiological process, stimulated by this unconscious drive through to the exhibition of PK effects. It is proposed that although this unknown process would normally be in a state of equilibrium, channelling both 'positive' and 'negative' energy, PK manifests when this balance becomes skewed. However, McConnell and Clark (1982a) argue that it remains unclear within this 'passive volition' theory whether PK effects occur during an imbalance on either the positive or negative side or even what these energies consist of.

To explore further whether PK may be produced unconsciously, Braud and Braud (1979) created two studies designed to investigate the occurrence of remote nocturnal PK effects using limited amounts of visual feedback. Moreover, whether relaxation would be conducive to PK effects. The premise focused on theories that nocturnal dreaming states are apparently psi-conducive, especially as a receptive state (Ullman & Krippner, 1970). Twenty participants were asked to remain in a state of passive volition when tasked with changing the rotation of a binary RNG light display. Limited visual feedback was given during the first study. However, in the second study, the light display was not shown to the participants, thus preventing immediate feedback. Pre-recorded relaxation instructions were played to the participants during the trial duration. Results were non-significant during the blind trials, but significant PK hits occurred within limited feedback conditions. These results not only lend support to PK as an unconscious process and also to theories developed by Stanford (1977b) that a dreaming state would counteract any effortful striving, previously identified as being counter-productive to PK effects; but that it is not essential for the manifestation of PK to have immediate feedback or information regarding performance; or that distances are necessarily restrictive.

2.7.8. *The 'linger' effect*

The 'linger' effect in PK experiments was observed by the Rhines (Rhine & Rhine, 1943) when PK effects were shown to occur after intended influence was brought to an end during a trial. This observation suggests that PK effects were the result of an individual's energy lingering on after an attempt of initial intention. This linger effect was further observed by the same researchers in trials where Felicia Parise apparently successfully attempted to influence the needle of a compass (Watkins & Watkins, 1974). As Rush (1986) has noted this linger effect for PK occurring only after an amount of effort has been made is also called the 'release of effort' effect. These findings are worth considering as evidence in

favour of a certain level of effort and striving being involved in generating a significant PK effect, albeit perhaps, not immediately. The possibility of a linger effect may also go towards explaining a lack of significant findings from experimental research, where popular design protocols are generated under restricted time conditions and participants are generally asked to focus intention during short, randomised periods of time, negating the possibility of delayed PK effects.

2.7.9. Unconscious vs. conscious striving

PK research conducted by Stanford et al. (Stanford & Fox, 1975) investigating the use of effort on the production of PK effects found that intentional striving for outcomes did not correspond to significant results, rather, that PK could be produced without a conscious effort. These findings are supported by research produced by Schmidt (1973; 1974) whilst investigating subconscious PK-REG effects with and without time displacement. Participants were asked to listen to barely audible signals through headphones, thus eliciting high levels of alertness without any physical exertion. During the listening sessions a random event generator (REG) developed by Schmidt would be connected to the auditory signals – signals were activated when the generator randomly stopped. PK effects were determined if the auditory signal was reached sooner than expected by chance. After negative effects were shown during initial testing sessions, Schmidt then decided to actively discourage success for the participants during the PK-REG tests, resulting in significant deviations ($t(29) = 3.66$, $p = .001$, 2-t). These findings are interesting as they support the theory that the level of directional intentional striving may be of importance, as it would be presumed that every researcher hoping to gain significant results would both consciously and unconsciously have a certain level of intention directed at gaining success. If intentional striving was optimal for either producing positive or negative deviations in statistical PK effects it would stand to reason that the majority of PK based experiments would succeed. In contrast, laboratory results throughout the years have remained inconsistent and open to interpretation. Furthermore, Schmidt (1972; 1973) has also conducted PK-RNG studies using a procedure including RNGs with various complexities – much like the RNG levels of Live, Pseudo and Table employed within the present empirical PK-RNG studies outlined further in Chapter Five.

Schmidt (1974) noted that PK effects appeared to be independent of the type of random event device employed within experimental sessions with findings using dice and RNG tasks proving similar in magnitude. In order to explore this further, he conducted a series of three PK/RNG experiments in order to empirically compare PK effects using two

different levels of randomness – ‘simple’ and ‘complex’. The trials consisted of the choice of RNG level being randomly selected beforehand using a recorded random tape and without either the participant’s or researcher’s knowledge. Both RNG level devices were located in another room to the participant. During each trial, the participant would concentrate on lighting one of two coloured lamps in the room pre-specified beforehand. Overall, thirty-five participants took part in the series of studies and length of the trials was approximated at one thousand each (including the pilot). The pilot test used 4 participants (including Schmidt). For the first experiment the participants were already selected due to their positive performance in previous PK studies and were also informed of the presence of two different RNG levels. However, in the second experiment, participants were the same, plus members of the test laboratory team; and for the third experiment participants were volunteers from the general public and only the simple RNG level was activated. To answer the initial aim of the investigation of whether there were PK effects under both RNG conditions, Schmidt observed that there were PK effects for both RNG levels, with scores for the ‘simple’ system being slightly higher, although the difference between these effects failed to achieve statistical significance when analysed using the critical region value (CR). Schmidt defined this as the ‘equivalence hypothesis’, whereby similar effects are observed within different task conditions which have related sensory input. However, such research opens the door for the present research in also attempting to answer the question as to whether varied randomness levels and individual differences have an impact on PK effects.

Instances of forced effortful striving whilst completing the PK task game ‘psi invaders’ were assessed by Crandall (1993) using an incentive of cash prizes as a reward for task success. It was proposed that such outright competition between the participants for such rewards would actively hamper task success as PK effects would be more likely to manifest within more relaxed conditions. The incentive of a cash reward would also serve to increase extrinsic motivation and effortful striving in order to achieve task success and the extra finances, which would also conversely decrease task outcome. Such effortful striving should also increase levels of arousal in individuals, pushing them over the possibly moderate levels needed to achieve task success and also PK effects, as highlighted previously by Braud (1981) whilst reviewing the roles of lability and inertia in psychic functioning. Results found that PK effects during the competitive condition were significantly below chance ($t(30) = -2.07, p < .05$). Although it was found that PK effects during the relaxed condition were above chance, these were not significant ($t(30) = 1.50, p = .15$), thus partially supporting the first hypothesis. However, there were no significant relationships found between levels of state anxiety and PK

effects in either condition ($r = -.05$ for each) and therefore the second hypothesis was left unsupported.

As Braud (1994) suggests, for individuals, there appears that a direct ‘need’ is necessary in order to produce PK effects (1991), although determining the level of such need, whether high, low or moderate, is still ambiguous. Furthermore, the evidence presented from previous studies creates further credence to the theory that high levels of motivation and effortful striving actually serve to impede PK effects during experimental tasks. Contrary to the observed sessions featuring Kulagina and Parise exhibiting high levels of physical exertion, within experimental PK-REG research there has only been significant evidence for a relationship between muscle tension and PK effects found by Honorton and Barksdale (1972). Even so, these effects were only shown to be within a group testing situation as opposed to the individual tests. As yet, there has been no further corroborating experimental research to suggest that high levels of exertion are necessary to produce immediate psi effects.

“...facilitating psychological factors include a thorough focus of attention upon the desired goal outcome...and the absence of effortful striving to achieve the goal.” (Braud, 1994, p. 8).

The inhibiting effect of striving was also noted by Debes and Morris (1982) during experimental PK-REG trials. Significant psi-missing effects were found when participants were asked to maintain a competitive strategy during the task compared to significant positive effects shown by those asked to use a relaxed approach. These findings add credence to the suggestion overall psi effects are more likely during a state of ‘passive volition’ as recommended by many parapsychologists (Palmer & Rush, 1986). Braude (2002) also supports a state of ‘passive attention or expectation’ (p. 78) being more conducive to producing successful scoring within PK-RNG studies. In following with this train of thought, it is desirable within the procedure of such experimental research that participants wish for a successful outcome before the session, rather than actively striving within the session. Braude offers corroborating evidence from biofeedback studies, whereby successful manipulation of bodily processes such as heart rate and skin temperature are more likely when the participants allow such changes to occur whilst observing immediate feedback, rather than actively push for it. Obtaining such results prompted the descriptive ‘passive volition’ (Green & Green, 1977) – a term now used frequently within both ESP and PK research.

2.7.10. *Feedback: Practice makes perfect?*

Honorton et al. (1982) compared the effects of immediate versus delayed feedback on PK performance in a series of three PK-RNG study (plus one control study). Participants selected for the first study had already passed a scoring criteria; participants for study two had failed the scoring criteria; and participants for study three were unscored visitors to the laboratory. Using two RNG conditions of feedback versus 'silent' the researchers hypothesized that there would be a significant RNG effect combining feedback and silent binary hits occurring in the first study. The procedure involved the use of a thermometer bar-style graphic presented to the participants on a video monitor which rose and fell. Feedback was generated via the use of the bar changing colour (white = above chance score; red = below chance; yellow = on chance) and an additional final 'Jackpot' display was given if the pre-set scoring threshold was met throughout the trial. The first trial consisted of only five participants (passed scoring criterion and the results did not achieve significance for any of the three studies. Although the researchers argue for the pre-screening of participants for experimental selection (following observation of individual performance of the five participants), the use of a larger pool would be of far greater benefit to a similarly arranged investigation of feedback effects on PK performance.

Recent experimental research conducted by Vohs et al. (Vohs, Park, & Schmeichel, 2012) discovered that instances of self-affirmation before a task followed by failure within that task led to further high levels of demotivation and effort reduction in new, yet related tasks. Although this research is not related to parapsychology specifically, this finding is interesting in regards to the protocol involved within the current study, whereby participants are asked to perform the same task under two different conditions. Furthermore, findings by Fisher et al. (Fisher, Minbashian, Beckmann, & Wood, 2012) have shown that individuals who have higher levels in performance goal-orientation reacted to task appraisals with negative emotions, compared to individuals with low levels in performance goal-orientation.

Furthermore, Braud (1980) proffered that the perception of lability is an important factor when studying intention on PK effects. He suggests that the psychological impact on an individual when exposed to either a perceived co-operative or non-co-operative system is completely different. Apparent changes to that system through directional intention may engender a state of confidence if those changes occur rapidly, or may cause negativity and frustration, even boredom, if faced with continuing stability. However, it should be noted that

researchers are generally aware of such impacting factors and (if not the theme of exploration), should implement preventative methodological protocols.

Despite (or even because of) theoretical wrangling, parapsychological researchers such as Rhine, Roll, Persinger, Rogo, Heath, Roe, Holt, Thalbourne and Storm have provided a firm basis for an attempt to be made to determine the various factors that may be conducive to producing a PK effect either within a controlled laboratory environment. These previous studies have paved the way for the present research to concentrate on a range of variables associated with PK effects – specifically, subjective stress and arousal (Braud, 1981; Crandall, 1993), the participant and researcher interaction (Schmeidler, 1997) and the effect of goal-directed striving (Braude, 1979).

2.8. Beginnings of Experimental PK summary

In summary, the seminal experimental PK research conducted by Rhine (1944) in the 1930s did produce significant results observing the patterns of PK effects, but was hampered by flawed methodology, a notorious cases of alleged fraud and the apparent lack or replicability in findings. However, as design parameters strengthened with the introduction of automated technology (thus excluding unwanted variables), researchers became confident enough to declare that PK as a phenomena did exist. Instead, research began to focus attention on ‘process-orientated’ investigations – exploring the possible mechanistic processes involved with PK performance. Rush (1986) has stated that process-orientated PK research has conceptual similarities to that concerning the supposed ‘other’ psi aspect of Extra Sensory Perception (ESP). Although often these two factors are often identified as having unrelated characteristics, findings from ESP research do have implications for similar PK research. This is especially true in relation to findings from ESP research in experimenter effects and intentional striving (the focus of two of the current experimental designs) where there is a distinct lack of similar PK research to create a firm theoretical basis.

In addition, certain individual difference factors within cognitive, emotional, behavioural and physiological functions were identified as possibly being conducive for optimal PK performance. Variables identified within this section have included the inherent belief (or disbelief) in psi abilities or the ‘sheep-goat’ effect; related motivation and effortful striving towards PK effects; and the impact of individual states and traits. There has been additional research into extraneous variables within the experimental environment, such as experimenter effects, and the attempts made to counteract such unwanted influences on PK performance. It has been from this progression of promising trial and error experimentation

that the current thesis has drawn its inspiration in devising a series of studies with which to better understand the processes involved in the manifestation of PK. Therefore, an additional chapter reviews the background and impact the newly developed construct of lability has had on recent foundational PK investigations and the subsequent role it has to play within the current thesis studies. As an aid to understanding the nature of PK, the following section reviews ideas regarding the purpose of PK abilities from an evolutionary standpoint.

The intention of this chapter was to present theories and evidence from relevant research regarding the nature of psychokinesis (PK). In doing so, it has initially explored possibly related manifestations of poltergeist activity, and discussed the similarities with reoccurring spontaneous psychokinesis (RSPK). It has then proceeded to review the methodology of experimental PK studies beginning with the pioneering ventures of J. B. Rhine using rolling dice. Aspects that may be inherent within the mechanistic processes of PK that had been identified from previously promising results and are integral to the development of the thesis were examined. This was then followed by a section reviewing the nature of stress on the impact of subsequent emotional and behavioural coping strategies and the implications maladaptive techniques may have on poltergeist and PK research. The impact of individual motivation within an experimental situation was assessed, especially in regards to the detriments of effortful striving or goal-orientated behaviour. Further, individual belief in the existence (and therefore occurrence) of paranormal phenomena was discussed in the ‘sheep-goat’ effect and the subsequent probability of success in PK experiments. Leading on from this line of enquiry, the nature of the actual task in PK studies was also taken into consideration through to contemporary researchers such as Roe employing modern technology in the form of automated random number generator (RNG) computer programs. The following chapters discuss the role of lability in the manifestation of PK phenomena and the design and construction of the initial survey study and in doing so, explore further the relationship between belief in the paranormal and perceived experience of paranormal events. In addition, connections between certain psychological aspects, paranormal beliefs and experiences, only touched upon briefly within this chapter are explored more comprehensively.

CHAPTER THREE

LABILITY: UNDERSTANDING A NEW CONSTRUCT AND THE IMPACT IT MAY HAVE ON PARAPSYCHOLOGICAL RESEARCH

3. Introduction

This chapter consists of a further literature review introducing a new construct of lability and the subsequent relationship it may have with psychokinesis (PK). In the previous chapter the nature of PK and also poltergeist activity was explored. It was shown that such manifestation, both in the field and experimental environment, is likely to be multidimensional and could be attributed to a variety of ‘living-agent’ factors. The progression of experimental PK research was reviewed and the role of random systems as an appropriate tool to identify PK effects outlined. The preceding chapter also introduced the new construct of individual lability as a factor within PK studies. Lability was presented as a likely candidate for the individual process that may act as a catalyst for PK effects. The present chapter considers lability in more detail by reviewing key theoretical concepts. The relationship between lability and PK effects focuses on previous experimental studies using random number generators (RNGs). This chapter aims to provide a firm basis for subsequently developing a lability measure with which to explore the relationship between paranormal beliefs and psychokinetic experiences provided next in Chapter Four. This developed lability measure is then employed within the methodologies of the following sequential empirical PK-RNG studies presented in Chapters Five, Six and Seven.

Therefore, the primary purpose of this chapter is to assess the construct of lability in order to provide a more systematic approach to generating a psychometrically sound measure of lability. The first section briefly outlines the concept of lability and its definitions within psychology as a whole. The focus then shifts to lability as defined within parapsychological remits. Parapsychological experimental studies exploring lability to understand the psi phenomena of psychokinesis (PK) and extra sensory perception (ESP) are reviewed. This review ranges from the most recent empirical studies by researchers Roe and Holt (respectively) which have underpinned the premise for the studies within this thesis, to those by Braud and Stanford on whose models the possible characteristics of lability rests. Findings from these studies suggest that the shared characteristic of lability can be defined as an ‘ease of change’. In addition, the nature of lability as viewed by neurological, emotional personality, creativity and physiology perceptions are offered, which gives further credence to an ease of change having a direct influence on diverse individual processes. A model of

lability based on the contributing areas of person, process and place is introduced to illustrate how such interaction could relate to the production of PK phenomena. Finally, the concept of a ‘labile’ person, able to show an ease of change within various individual differences and have a relationship with anomalous experiences is discussed.

3.1. What is Lability?

Lability, stems from the Latin ‘labilis’ meaning an ‘apt to slip’ and has been previously used to describe states within various dimensions of psychology. It is deemed a mechanism of instability whereby a process is liable to fluctuate easily and with frequency (Harvey, Greenberg, & Serper, 1989). In general psychological usage, such a lack of stability is symptomatic of affective, emotional and neurological disorders such as Borderline Personality Disorder (BPD), bipolar disorders and epileptic disorders (Reich, Zanarini, & Fitzmaurice, 2012). Yet, although lability has become familiar as a term within general psychology, there has been little attention given to what the lability process involves. To describe a state or psychological process to have lability has meant that that it has an ability to fluctuate between different levels at an increased rate, as seen within bipolar and epileptic disorders. Lability has been defined previously within individual processes such as affect and mood states respectively as:

“...a multi-faceted construct composed of frequent and intense fluctuations in affect in response to both pleasant and unpleasant events.” (Thompson, Berenbaum, & Bredemeier, 2011, p. 53)

“...sudden, exaggerated, unpredictable and developmentally inappropriate changes in mood...is an umbrella term that captures pathological changes across several mood states.” (Birmaher, et al., 2013, p. 253)

However, there is a lack of information as to whether individuals have varying levels of lability in different processes and if these levels have an impact on either psychological or physiological responses. The concept of lability is in direct opposition to a state of inertia. Furthermore, both definitions show the lability potential as having a ready or easy characteristic, suggesting that the change is uncontrollable and not restricted by conscious awareness. As lability in individual processes is prompted by either internal or external cues this offers the opportunity to manipulate lability levels within an experimental environment through the use of novel situations and mediating contextual factors.

With parapsychological research striving to understand the processes involved in PK effects within experimental environments, attention has turned to the complicated interaction between intra and interpersonal factors. Experimental PK research has turned to exploring the relationship between individual processes and the environment with the role of individual lability gaining considerable interest. As reviewed in Chapter 2, a promising avenue of research has been investigating PK effects via changes within an external random system in PK-RNG studies. A definition of lability within parapsychology has since been determined by Braud as:

‘...the ease with which a system can change from one state to another, the amount of free variability in the system’ (1980, p. 1)

With this in mind, the occurrence of PK effects in experimental situations using a random system is highly suggestive of an important relationship between lability and PK. In identifying lability as a possible facilitator within both intra and interpersonal factors would do much to enhance our theoretical understanding of PK. Furthermore, it would provide the opportunity to develop a consistent research methodology in order to create a potential predictive model of PK effects.

It is apparent that there is a common theme running throughout the different psychological uses of lability - that of fluctuation or ease of change.

3.1.1. ‘Ease of change’ – The Characteristic of Lability?

Therefore, if such an ‘ease of change’ is the defining characteristic of a process being labile how does this relate to how, when and where lability occurs? Such a fluid characteristic argues that the processes involved should be on a spectrum, where change can occur between different levels. Processes commensurate with such qualities can be found within emotional, neurological, personality and creative aspects of psychological research. In psychology, there is no universal model to define ‘change’ and how it may be influenced. Although it is accepted that change occurs whereby something is altered or there is a transition from one state to another. As such, changes can be effected via the manipulation of impacting factors from which new features may emerge. Therefore, the effect of different domains can be encapsulated as - situational lability stemming from a need to adapt and evolve; creative lability observed through inspiration and output; emotional lability related to affective disorders; neurological lability witnessed by neuronal activity and accompanying behaviour; lability within levels of psychological states.

A tentative proposal by the author for the usefulness of individual lability may stem from the need for organisms to adapt successfully within unpredictable situational scenarios and for humans, may possibly be mediated by gender differences. Lability may also be yet another competitive force within evolutionary domains and so offer a better understanding of the different labile levels in systems and the apparent generation of psi effects caused by the interaction between such levels. In this instance dependents of psi in relation to lability equate to the person, processes and the place. Such a model can be represented by the occurrence of PK phenomena apparently manifesting from cumulative effects of individuals, their conscious and unconscious processes and the surrounding environment.

3.2. Lability within Parapsychology

Stanford (1977) states that one of the main concepts driving contemporary parapsychological research revolves around discovering psi-conductive variables or as described by both Braud (1975) and Honorton (1974) - 'psi-conductive syndromes'. In exploring which variables may predict PK effects, recent theories have suggested that one of these brand new psychological constructs – that of lability, the ability to fluctuate – may have a significant role to play. Braud (1980b; 1981) and Stanford (1974b; 1978), have proffered plausible models regarding lability within different random systems and how this might relate to psi effects. Stanford (1978) proposed that psi is a result of the conformance of one random system to the needs of another disposed system. Braud (1980) builds further on this premise by offering that the magnitude of such conformance is proportional to the inherent lability within each system. In this instance, the disposed system would be relatively stable and low in lability and the conforming system characterised as having high lability and therefore relatively disposed to change easily. Both these models are elaborated more fully in Section 3.3. However, despite stringent efforts by many researchers there is a general ambiguity in how to comprehensively assess what individual lability *is* and consequently, how best to measure it in order to explore its role in PK effects. This lack of understanding was addressed in recent research by Holt and Roe investigating the relationship between levels of lability and PK effects using different RNG lability sources and which sought to measure individual lability through the compilation of individual difference measures. This and similar PK-RNG studies have created a practical template for the empirical studies completed within this thesis. Therefore, the following sections critically reviews previous experimental PK/ lability research and how the findings have impacted on the quest to better operationalize the construct of lability and discover its possible relationship with PK effects.

3.2.1. Exploring Lability – The Research of Holt and Roe

In following Braud's theory of lability conformance, Roe (1996) developed a study investigating the role of RNG lability levels on PK effects using Tarot card readings as a task. Participants were informed that to limit any sensory leakage, readings would be forwarded by the Tarot card reader via a computer interface. However, readings were actually generated either by an RNG (high lability) and a pre-determined random number table (low lability). Participants were given equal numbers of readings from each RNG lability source, but remained blind to the true sources of readings and were asked to rate them for accuracy. Findings showed that participants' accuracy ratings were significantly higher for statements from the high RNG lability source than those from the low RNG lability source, following the predictions generated by Braud's model (1980). These results allowed for greater scope in investigating the role of lability levels in PK-RNG research in particular.

Following on from this study, further relevant PK research exploring the role of lability has been undertaken by Holt and Roe, respectively. Holt et al. (2002) undertook an investigation into the relationships between creativity, subjective paranormal experiences and altered states of consciousness. The 211 male and female participants recruited from various walks of life completed 9 self-report measures, 7 of which detailed different aspects of creativity. Following a principal components analysis 7 underlying dimensions of creativity were identified. But only one dimension, defined as 'intrapersonal awareness' yielded significant positive correlations with elements relevant to the lability interests of this thesis – that of extraordinary mental process, $r = .51, p = .000001$; subjective paranormal experiences, $r = .45, p = .000001$; hypersensitivity, $r = .43, p = .000001$. This dimension loaded most on aspects of emotional creativity, heightened internal awareness and non-linear cognition. The researchers concluded that in this study it was the 'openness to and exploration of psychological space' that was important to the participants relating subjective paranormal experiences, rather than having a creative personality per se. By referring to an individual's adaption to a presented 'psychological space' such as a paranormal experience is synonymous to the generation of novelty in the creative processes equated to lability by Braud (1980).

Whilst investigating the role of the sender in Ganzfeld Extra Sensory Perception studies (GESp), Holt and Roe (2006) incorporated a multilevel RNG as a 'virtual receiver' providing mentation statements to be associated with the clips from the target pool. The decision to use a computer to act as a virtual sender was two-fold, following difficulties in recruiting persons for sender and receiver roles in previous studies and subsequently

scheduling GESP sessions. In manipulating the randomness of the RNG for the source of target clips, the researchers were following in the footsteps of Braud (1981), who was an active proponent in the importance of lability in the production of PK effects. In addressing the question of what might characterise individual lability, the researchers took their cue from the previous studies by Braud and colleagues. (1982; 1983)

More recently, Holt and Roe (2006) attempted to measure individual lability derived from trait factors of cognition, affect, experience and behaviour, shown to have marked stable vs. labile changes by using a compilation of five individual measures: the Neo Five-Factor Inventory (Costa & McCrae, 1992); the Personal Philosophy Inventory (Persinger & Makarec, 1987); Mood (Akiskal, et al., 1995); the Emotional Creativity Inventory (Averill, 1999); the Creative Cognition Inventory (Holt, 2007). These measures were either chosen due to trends from past research or from the balanced postulation of compatibility with labile-like characteristics. It was Braud (1980) who postulated that lability could correspond with the ‘novel generation’ involved in high levels of creativity and Holt et al. (2002) who discovered that in particular, a creative aspect described as ‘intrapersonal awareness’ correlated significantly with spontaneous anomalous experiences..

In this study, RNG levels were graded as being live, pseudorandom and random table with individual lability scores divided into high, medium and low. The study predicted that it would be low lability levels facilitating PK effects, due to the RNG systems need to conform to the PK agent’s target intention. Therefore, high RNG lability would interact with low levels of individual lability in order to produce PK effects. With a sample size of 40 male and female participants, conducting a mixed 3 x 3 analysis of variance found a significant interaction between individual trait lability and RNG lability $F(4, 74) = 5.0, p = .001$. The prediction that low individual lability would show higher psi hits with high RNG lability was confirmed, $t(12) = -2.50, p = .03$ (2-t). In addition, a mirroring effect was observed, with high individual lability showing psi hits with low RNG lability, $t(12) = 3.06, p = .01$ (2-t). These results support the lability interaction theories of Braud (1980) and Stanford (1978) and replicate the promising findings from the study a decade earlier by Roe (1996). However, although the findings from this study are optimistic in terms of lability interaction, the assessment of individual lability from an aggregation of individual measures still left the door open as to querying how individual lability is characterised – are there specific factors involved? This study has gone some way to exploring individual difference aspects that do and do not have a correspondence with individual lability is.

The role of lability levels was again the focus of a third related study Roe and Holt (2006) assessing the role of the sender in GESP with the additional variables of strategy effects and feedback. Following the protocol of the previous study a composite score of the previous individual difference measures was used to gain an overall lability score. Correlations between these components and the composite measure were performed, showing to be significant for all but the mood items. However, the researchers did not omit these items in order to retain standardization with the preceding study. A sample of forty participants were subsequently categorised as having either low, medium or high lability. The levels of the RNG were also similarly categorized as being Live (high) Pseudo (medium) and Table (low). A mixed 3 x 3 ANOVA using PK performance as the dependent variable did not show any main effects for levels of RNG or individual lability. Yet, there was a significant interaction between RNG lability and individual lability, $F(2, 74) = 2.75, p = .03$. Furthermore, significant post hoc tests revealed this interaction adhered to the predicted pattern of high individual lability levels gaining psi-hits with the table RNG level, $t(12) = 2.76, p = .009$ and low individual lability levels gaining psi-hits with Live RNG level, $t(12) = -1.93, p = .04$. These encouraging results further supports the lability interaction found within earlier studies and offers a relatively firm foundation for the continuing investigation of lability interaction in this current thesis.

3.3. Models of lability

The following sections review the two main lability models pertinent to the studies within this thesis. The models are that of the Conformance Behaviour Model (CBM) proposed by Stanford (1978) and a later Noise Reduction model proposed by Braud (1980a) which owes its premise to that of the CBM.

3.3.1. Conformance Behaviour Model

The first model presented to understand lability within parapsychology is the Conformance Behaviour Model (CBM), developed by Stanford (1978). According to Stanford psi is viewed through the prism of the CBM as:

“...somehow organizing loose, disorganized or random processes such as their outcomes accord with the dispositions of someone or some organism which has an interest or concern about these outcomes.” (1980, p. 91)

This model states that random systems are disposed to conform to another, albeit unequally, labile random system. Stanford developed his CBM model for psi processes

following abandonment of his previous Psi Mediated Response model (PMIR) which favoured a psychobiological or cybernetic approach. In the CBM Stanford argues that the complexity of a PK task in an experimental environment is independent of any subsequent PK effects. Evidence against the cybernetic model can be found in the statistically significant effects observed after PK-RNG studies using both blind and known targets as the cybernetic model presumes that there would be no PK effects in relation to participants using an unknown or blind target. Furthermore, the cybernetic model proposes that PK functions are analogous to motor skills and sensory information processing and in the face of complexity, there is an obvious deterioration within these functions. However, in the findings produced from the PK-RNG studies using systems with different complexities, this has not been found to be the case. Stanford therefore proposes that to imbue PK functioning with the same mechanisms and characteristics as any other known physiological process would be inherently flawed. Rather, the characteristics of psi processes should be dispositional. This concept is also suggested by Braude (2002), whereby it is the individual participant's state that is actually conducive to the manifestation of PK effects within experimental research.

Stanford theorises that psi effects are not mediated by the same mechanistic processes necessary for perception and how sensory information is managed, but that variability within (as yet) unidentified processes allow for the detection of psi. In this instance, contrary to known sensory information processing, psi effects would not be similarly affected by the complexity of a given task. In accordance to the CBM Stanford states that psi production is synonymous with the conformance behaviour of different random event generators such as artificial REGs and RNGs towards a 'disposed system'. Such a disposed system within either an experimental or real-world environment would tend to be an individual's physiological processes. However, for such conformance behaviour to occur it is necessary for the REG/RNG to produce random events that are described rather charmingly by Stanford as being 'unequally attractive' (Stanford, 1986). For systems to be described as being labile they would be characterised as having high levels of random fluctuation. Furthermore, a great range of events with randomness as a key characteristic would be able to be influenced by psi effects. This high degree of ease of change according the model should therefore produce a greater amount of conformance behaviour than more stabile systems. It may follow that such conformance by labile systems is the inherent need for creating some form of order from randomness. Stanford initially proposed that such a model would also add support to the unitary theory of psi as it does not distinguish Extrasensory Perception and Psychokinesis as separate aspects. Mishlove (1997) offers further support for the CBM concept that the

mechanistic processes of psi are distinguishable from known sensory information processes, by discussing that in relation to experimental PK research, PK effects are not mitigated by using complex random number generators that employs multiple random processes.

This theory is in contradiction to an earlier model proposed by Thouless and Wiesner (1948) who stated that paranormal cognition and psychokinesis were:

“...merely unusual forms of processes which are themselves commonplace...related to perception and motor activity...” (p. 195)

In addition, this model proposes at the onset that there is no differentiation between the two recognisable aspects of psi – ESP and PK – that they are unitary phenomena that is adapted to suit the host systems intention. In addition, this intention would be systematically dispositional and therefore, the randomness of a system has the ability to conform when exposed to a stronger, more ordered system. In this instance, the degree of the PK effect is directly proportional to the amount of variability in the target system and suggests that there are various inherent limitations within lability levels. Kennedy (1995) argues that such conformance by one system to another is reliant on unconsciously achieving a goal, rather than being based on consciously gaining information. In relation to PK effects, an individual's performance would be mediated by intrinsic motivation, rather than by the systems own information processing capabilities.

In contradiction to the noise reduction theory to follow, the model also states that direct observation is not necessary for psi effects. Meaning that within an experimental situation a participant may be kept completely unaware of the nature of an experimental task and would also not need additional feedback regarding psi performance. However, the implied restrictions on lability do not offer evidence as to whether similarly grouped systems have individual variation. In addition, although Stanford's model does posit that psi effects are not constrained by the complexity of a task, it also does not fully explain the impact of other systems. Rush (1986) adds to this argument by wondering whether successful PK-RNG experiments occur due to the lability of the systems involved and/or whether the individual believes that labile systems can be influenced. However, as noted by Storm and Thalbourne (2000), Stanford later began favouring the concept that PK and ESP did have separate processes, which may seem to be at odds with aspects of conformance behaviour model favouring a unitary explanation of psi (Stanford, 1990). However, such proposed conformance behaviour characteristics holds relevance for the production of PK through the labile effects of differing systems. Stanford (1980) did originally confer detached properties,

whereby PK effects were categorised as occurring as outside a system and with ESP effects occurring internally, with the determination of each dependent on the circumstances in which they occurred. Furthermore, the CBM allows for psi-missing effects, whereby the conformance interaction between the systems is misdirected, with psi effects not occurring with the target. Such psi-missing effects may also offer a plausible explanation for PK and poltergeist manifestations in real-world environments, where phenomena appear to have a consistent lack of intentional direction.

Encouraged by the predictions of system lability interactions on the production of psi effects from Stanford's CBM, Braud published a review, including criticism from other researchers and the details of a series of seventeen studies conducted by himself with the aim of exploring the conformance behaviour further (1980).

3.3.2. Noise Reduction Theories

Braud has presented a 'noise reduction' or 'lability/inertia' model (1980) where, as with Stanford's CBM (1978), lability is synonymous with randomness and inertia is defined as a resistant to change. This model offers that individuals are constantly bombarded by interference or noise caused by both external information, sensory input and the effects of internal processes. The noise reduction model stems from the need for an individual to develop an unconscious process with which to filter out such 'noise' in order to manifest psi processes effectively. Braud suggests that such noise can be caused by sensory and perceptual cues, somatic and mental processes and, in relation to psi, excessive striving (1978a).

Taking its cue from classifications developed by Pavlov (1927) for different types of nervous system responses observed within his canine subjects, the model emphasizes that the facilitation of psychic functioning relies upon the labile capabilities or 'free variability' within random systems, such as the human brain. This has prompted the question within experimental psi research that lability within certain processes may have the potential to be psi-conducive (see section 3.4 for elaboration on this issue). This theory, although encompassing psi collectively, has had great impact towards better understanding the manifestation of PK in particular as it considers that it is possible to measure lability within individual differences in order to assess the impact of psi influences. According to Braud (1980a), the more labile a system is, the greater the likelihood for psi effects, with the magnitude of PK effects being directly related to the level of inherent system lability. Conversely, the more inertia equals less possibility for psi effects. With this in mind, Braud proposed that biological systems are more likely to be labile due to the innate variability

within internal processes and their obvious unpredictability. Factors such as conscious awareness and focused attention could therefore have a detrimental effect of psi performance as such concentration would lessen the lability of internal human processes necessary. In opposition, exposure to a novel situation, such as an involving experimental PK task, would heighten labile capabilities due the need for processes to adapt. Similar to the CBM, Braud proposes that individual lability may be an inclusive factor in a multi-factored model for the manifestation of psi effects, rather than the sole catalyst (2002).

At the time, Braud (1980) completed a series of seventeen studies manipulating a variety of systems which were thought to have potentially labile capabilities such as REG/RNGs and biological systems. In brief, studies one to twelve involved biological target systems; studies thirteen and fourteen involved systems with non-systematic variability (light sources); study fifteen was a within-subjects GESP study; study sixteen was a between-subjects GESP study; and study seventeen was a non-verbal motor response study. Braud stated that there were two forms of conformance behaviour to be explored – 1) external systems conforming to an individual's intention; 2) the individual's mental systems conforming to the external source. Findings showed that overall, studies one through to fourteen showed conformance behaviour with the external system conforming to individual mentation, but with the findings of the final three studies remained inconclusive. However, in his conclusion, Braud suggests that there was enough evidence that conformance behaviour was more likely exhibited in highly labile external systems – although, at the time, there was no determination of how lability could be measured in the individual, so there is little to support the interaction between high and low lability levels in different systems predicted by the CBM.

A later particularly successful PK study used a sample of young children (Braud, 1981). Significant PK effects were shown when the children were required to move a remote controlled toy when listening to a recording of their mother's voice – a personally relevant auditory stimulus. A further psi study (Braud, 1981), using a separate adult sample, explored autonomic nervous system activity (ANS), by monitoring electrodermal activity (EDA) throughout two different psi tasks using the Ganzfeld technique. The Ganzfeld technique derives its name from German for 'total field' and is probably the best known and most popular method for investigating psi phenomena. During altered states where the mind is subjected to less interference it would be more conducive to psi. Therefore, the Ganzfeld technique is designed to reduce sensory input and comprises of an individual being placed within a darkened and sound-proofed room. This 'receiver' participant sits comfortably as the

room is bathed in red light, their eyes are covered with the semi-transparent halves of ping pong balls and often an ambient auditory stimulus of either pink or white noise is played to them. Meanwhile, in another similar environment, the ‘sender’ participant is asked to consciously convey information to the ‘receiver’ whilst they are in this relaxed, free response state. Braud’s tasks involved a free response Ganzfeld ESP task, whereby a ‘receiver’ is asked to verbalise any images that they might think about, to see if any match the images being sent by a separate ‘sender’. According to meta-analyses, it has been via this methodology that much of the significant findings for psi have been observed (Storm, Tressoldi, & Di Risio, 2010). The second psi task involved ‘motoric’ clairvoyance. This type of clairvoyance uses unconscious muscle movement in response to stimuli, such as can be seen with Ouija boards. In both conditions psi success was significant during a moderate decrease in physiological arousal. Although these findings are suggestive that low levels of arousal are necessary for psi effects, the above physiological studies have concentrated on ESP and therefore the role of arousal for PK effects remains debateable. Based on the observation of macro-PK with individuals, it is hypothesised that conversely, there are optimal arousal levels for the manifestation of PK. If arousal is related to lability by the ease at which change occurs, it would necessitate that there would be a positive correlate – as levels of arousal increase, so would levels of lability and therefore psi effects. However, the present research presumes that ESP and PK are separate processes that may rely on opposing characteristics, so the above studies fail to shed further light on the production of PK effects specifically.

Furthermore, inherent cognitive lability or information processing was explored using a procedure involving an auditory stimulus of a word played repetitively with other words randomly inserted into the loop. Lability was assessed by calculating how many other words the participant was able to hear. Psi ability was then assessed by the same participants performing with a card guessing task. The relationship between both cognitive and psi lability was then assessed using correlational analyses, but failed to find any significance. Notwithstanding these findings, Braud (1980e) was able to identify distinct sources of distracting ‘noise’ that may have been acting as hindrance for PK effects. The classification of the disrupting ‘noise’ has been subdivided by Braud into seven distinct categories encompassing physical, cognitive, visual and behavioural interference with accompanying experimental methodology employed in an attempt to decrease the magnitude. Out of these seven disruptive influences the impact of effortful striving or the participants willing a successful outcome using a goal-orientated technique was observed to be particularly detrimental. This form of conscious effort by individuals to create a change opposes the ease

of the possibly unconscious process of lability, especially if inherent lability is person-specific. Yet, in addition, Braud was able to simultaneously provide several counteractive psi-conducive design procedures which have provided a basis for modern day experimental methodology including the Ganzfeld technique (sensory deprivation); progressive relaxation; autogenic exercises; non-analytical activity; meditation; absorption in the psi task; an incubation period; immediate feedback; practice. These practices can be seen to increase lability capabilities, by filtering out the external and internal 'noise'.

Alternatively, Braud (1980) also conducted experiments using electrical lamps as a stable system in contrast to a labile system in the form of a candle being blown by a small fan. Participants were required to influence the power of both systems with two condition of immediate and delayed feedback on their performance. It was observed that both immediate feedback ($t = 3.35, p = .003$) and delayed feedback ($t = 3.66, p = .0017$) were significant on PK performance. A subsequent test using only immediate feedback on PK performance and comparing the same labile system with an inert system revealed further significance in influencing the labile system ($t = 2.60, p < .02$) but not the inert system. As Braud theorises that psi processes are more probable when the brain's processes are in an unsettled labile state and freed from constraint, simple studies were instigated to observe whether the lability of these processes could be influenced using unstructured tonal auditory stimuli (Braud, 1980a). It was suggested that variability within sound would mirror a similar variability within a cognitive state. Findings suggest that there was a trend for an increase in psi effects following unstructured tones rather than structured tonal sequences, although significant results remained elusive. In a study incorporating a computer-based oracle named 'Algernon' as part of the psi task Braud and Schroeter (1983) showed how randomness or lability could be manipulated easily within the experimental protocol. Results was found that high lability selection levels, such as using a radioactive RNG) corresponded with larger effect sizes with lower selection method levels, such as using static random number tables produced lower effects. Although the results proved not to be significant, this interesting trend prompted such a method to be adopted in more recent experiments to by Holt and Roe (2006).

Following these sequential experimental studies, at the time, Braud could not provide conclusive evidence to support whether more labile systems were more susceptible to psi processes, although encouragement was offered to future research – "an important question is whether this lability effect is physical or psychological." (p. 130).

In exploring lability in relation to PK effects and other individual process, Braud et al. (Braud, Shafer, & Mulgrew, 1983) conducted studies which explored cognitive lability in relation to psi effects by correlating word associations and perceptual lability alongside psi scores. The researchers explored individual lability against different sensory stimuli in two experiments. The first involved an auditory stimulus of repeating the word 'cogitate' over a 16 minute period with various different words or phrases interjected throughout. The researchers took their cue from the hypothesis that more labile individuals would project their own meaning onto banal stimulus. In the first experimental session thirty-two participants were asked to verbalize what they heard whilst listening to the recording. Individual lability was gauged as to the number of other words or phrases heard during the session. In order to explore psi effects, the aim was to try and influence the participant's perception of the auditory stimulus and therefore a randomly selected target word was interjected quicker compared to a matched control word. The second experimental session explored psi effects and involved the use of an agent within a separate room who listened to the verbalizations of the participant and attempted to influence their responses. Psi effects were calculated as the difference between the ordinal positions of reporting target words versus controls. The further inclusion of Ganzfeld stimulation prior to the sessions suggests that the studies were more concerned with ESP aspects of psi, rather than PK. It was predicted that there would be a significant relationship between individual lability and psi effects. After data from thirteen participants were found to be unusable the results found a significant positive correlation between scores and word associations ($N = 19$, $r = .39$, $p < .05$, 1-t). The second study used a visual stimulus of a Necker cube, an optical illusion based on an ambiguous line drawing and is often used to gauge the consistency of an individual's perception. The methodology was similar to that of the first experiment, but introduced the visual stimulus in place of the auditory. Thirty-two participants viewed the Necker cube on a slide and reported the rate at which the image reversed by pressing a button which relayed information to a polygraph machine in a separate room. The procedure involved the image changing at 2 pre-set 1 minute intervals. During two other 1 minute intervals the participants were asked to try and reverse the image themselves. Each interval had a thirty second rest period in between. Individual lability was judged using the polygraph ratio score rate during the pre-set and control periods. As before, an agent was placed in another room and attempted to influence the Necker cube also – either by increasing or decreasing changes. Psi scores were interpreted as being the difference between an increase and decrease in changes. It was similarly predicted that there would be a significant positive relationship between lability scores and psi difference scores.

However, analysis revealed non-significant results. The findings from these conjoined studies has provided support for Braud's lability/inertia model and the relationship individual lability may have with other individual difference processes. However, as the researchers remained unsure as to the nature of the psi effect as the sessions employed procedures more suited to ESP than PK, although it could still be argued that either or both processes may have been involved. In finalization, Braud states that in accordance with his lability/inertia model it is high levels of lability that would have the most rapport with psi effects, regardless of whether they be ESP or PK orientated (Braud, Shafer, & Mulgrew, 1983).

Braud (1982) has also outlined his lability/inertia model within a pilot study exploring further the impact of sensory stimulus on PK. Following from the basis of his model whereby psi effects are directionally proportional to the degree of lability within a target system and the degree of lability within an individual. He also states that such individual lability may rely on the degree of intention directed towards achieving a goal. To give an example, Braud hypothesises that for PK effect to occur would rely on a target system with low levels of lability and a human agent with clearly defined intentions which are not influenced by any other interferences, and therefore has high levels of lability. He then posits that the practicing concentration via visualization should then be an aid to increasing focused intention and lability levels. The study involved seven participants attempting to influence an REG equipped with coloured lights for immediate feedback. For six weeks prior, the participants had daily intensive training emphasizing the visualization of colours. Pre-test session were included each week which assessed imagery using self-report measures and with PK effects being tested using the aforementioned Necker cube reversal procedure. It was predicted that there would be an improvement in PK scores after the six week training duration. The results showed a significant difference between pre and post training scores ($Z_{\text{diff}} = 2.84, p = .004, 2-t$). There was also a significant positive correlation between PK effects and the amount of visualization training ($r = .84, p < .02, 2-t$). Such exploration into the impact of practice harkens back to the observational testing of individuals such as Kulagina and Parise, who also believed that their own PK abilities were lessened without consistent practice. However, regardless of these interesting findings and the initial aim of Braud, the study does neither help to broaden understanding of the role of individual lability in PK effects or the relationship presumed between intention and lability. It appears that with these studies Braud is suggesting that individual lability is directly tied to other individual processes – sensory, motor, cognitive, and physiological – which is also able to be consciously altered. Such a premise therefore opens the door for further research into the characteristics of individual

lability and how it may impact on PK effects. By exploring the relationship between individual difference processes on PK effects an obtaining significant results allows for consideration of lability as a similar process which may also impact PK effects.

3.3.3. Summary of lability models

Both Stanford and Braud agreed that conformance behaviour was able to study psi through testable hypotheses and viewed their own experimental studies as a useful base towards understanding psi processes through system lability. Yet, they also acknowledged that these experiments were not sufficiently methodological sound enough to assess the effects of any possible confounding variables. Stanford states that the researchers were well aware of possible ‘manipulations’ caused by individual differences and the subjective perception of the experimental environment, but felt that checks they ran after the experimental sessions using self-report measures would be unable to provide reliable feedback (Stanford, 1980). In such an instance, gaining immediate feedback from the individual as they participated within the experiment would be far more precise, such as that gathered using physiological measures.

3.3.4. Criticisms of the lability concept

In addition, the concept of lability as an experimentally testable tool does have its detractors within the field of parapsychology. Following the publication of the CBM, during his Presidential address to the Parapsychological Association (1979b), noted parapsychologist John Palmer expressed doubts that the lability conformance concept was still “merely a new descriptive language...” (Braud, 1980, p. 128). In addition, Beloff (1978; 1979a) had also publicly voiced concerns at two parapsychological conferences over the CBMs premise that conformance behaviour could occur within even primitive systems and inanimate objects. During his review of the CBM, Braud (1980) has addressed these issues by stating that descriptive of conformance behaviour was already acknowledged within psychology domains of memory and creativity amongst others. He also offers that at that time (as now), theories attempts to concretely explain the nature of psi has not been achieved, with the use of statistical findings still only able to offer descriptions, rather than explanations. In regards to the arguments of Beloff, Braud has stated that this concern may have been bred primarily from a distinct clash with Beloff’s own support of the psychobiological research paradigms of psi arising from the complex mental processes of the individual.

In the years since these vocal admonishments, it is hoped that the body of research on lability that is accumulating will help to convince the parapsychological research audience of its veracity in psi studies.

3.3.5. Lability within Parapsychology Summary

Essentially, within parapsychology it is apparent from the most recent experimental PK-RNG research that the concept of lability has opened a new and exciting avenue of enquiry, capable of replication and elaboration. This holds especially true in regards to the interaction between opposing levels of lability between two systems which takes its cue from Stanford's preliminary conformance behaviour model. Furthermore, the impact of individual differences and experiences and the environment in regards to cognitive and sensory interference must be considered based on Braud's 'noise reduction' theory (1980). Therefore, lability in this context is defined as an unconscious change within levels of individual differences, which may be stimulated by a novel situation. Psi phenomena occur when systems with varying lability levels interact, but in contradiction to Stanford's conformance behaviour model (1978), does not necessitate adaption by the lesser labile system to the greater labile system. However, PK effects, specifically, are detected when individuals with lower lability levels interact with external systems with higher levels, which may relate to the role of an individual agent with abnormally suppressed psychological and physiological states within poltergeist scenarios.

3.4. Lability Within Psychology

The following section briefly reviews the concept of lability within mainstream psychology in relation to physiological measures and individual differences. The aim of this section is provide a basis for the inclusion of certain aspects with which to measure individual lability further discussed in Chapter 4.

Therefore, the following section discusses which factors have been identified through previous research as being of possible import to lability as a construct. These factors include the physiological response of electrodermal activity, affective states, neurological activity, aspects of creativity and the personality trait of openness to experience.

3.4.1. Lability in Affective States

Affective lability has been defined as "rapid shifts in outward emotional expressions" (Look, Flory, Harvey, & Siever, 2010, p. 187). Koenigsberg (2010, p. 61) has argued that the "construct of affective instability has multiple components and may be associated with

multiple neural systems” and consists of two major factors - frequency of change and intensity of affect. According to Coccaro et al., (Coccaro, Ong, Seroczynski, & Bergeman, 2012) affective lability is defined as the degree of intraindividual variability of affective experiences which are known to consistently differ. Furthermore, such lability is representative primarily by the rapid shifts in negative affective experiences that are symptomatically found within emotional, personality and mood disorders. Such labile affects state Larsen (2000) can be predictive of either resilient qualities or the development of psychopathology.

Even at the onset of scientific parapsychological investigation, considerable interest has focused on the connection between apparent emotional maladjustment or negative affect and paranormal beliefs including an early study conducted by Maller and Lundeen (1934), which found high positive correlations between emotional instability and superstitious beliefs – unsurprisingly pertinent in the midst of societal upheaval cause by the Depression at the time. Conversely, Haraldsson (1981), has investigated whether there is a distinguishable ‘type’ of person reporting psi experiences and in a later study exploring cultural differences in reporting psi phenomena (Haraldsson & Houtkooper, 1991), found that on the Bradburn Affect Scale (Bradburn, 1969), both ratings of positive and negative affect traits were applicable to the perception of psi phenomena, rather than clustering on either pole, suggesting that experiences were perceived as having both good or bad aspects. This finding suggests that during a perceived paranormal occurrence, affective states fluctuate rapidly across a spectrum of feelings and are not restricted by remaining either negative or positive. The ability of affective states to change rapidly and with apparent ease resonates with the concept of lability. According to Henry et al. (Henry, et al., 2001) the affective instability characterising borderline personality disorder (BPD) may be directly compared to the ‘autonomic lability’ observed with depressive and bipolar disorders, which includes low levels of emotional stability. Henry et al (Henry, et al., 2008) investigated the relationship between affective lability in BPD and bipolar disorders and found that although the two disorders shared this same trait, they displayed different patterns in the changes from euthymia (reasonably normal state) to extreme positive and negative states. It is also concluded that such affective lability within such disorders may be caused by changes within individual neurobiological processes. Finally, it has also been tentatively suggested by Coccaro et al. (Coccaro, Ong, Seroczynski, & Bergeman, 2012) that within affective disorders, it is the lability dimension that is the deciding inheritable trait, rather than the actual disorder itself.

Within fields of psychology such as abnormal, health and cognitive neuroscience, the employment of the term lability is seen more often within research investigating mood disorders and dysregulation of affective states, where such affective lability is observed as being the degree to which emotions are able to change in intensity and valence. In this instance, such alterations are generally termed as having ‘instability’ or having ‘dysregulation’ – basically, being considered labile, by any other name. It is acknowledged that such prominent fluctuations in mood and affective emotional states are symptomatic of bipolar, stress related and depressive disorders and are theorised to have a strong relationship to the potential development of further psychopathology and maladaptive behaviours (Stone, 1993). Yet, such disorders occur when there is a lack of emotional regulation, a process which normally occurs rapidly in the face of an unwanted emotional reaction. According to Lazarus (1991) emotional regulation is classed as a secondary emotional response following appraisal within an initial primary emotional response. In addition, as temporal lobe lability has a relationship with other cognitive disorders, previous research (Holt & Roe, 2006) has integrated four selected items relating to mood lability from measures developed to screen for bipolar disorders (Akiskal, et al., 1995), which include the frequency of mood alterations; the range; and temperament assessments between happy and sad. These items specifically address subjectively perceived fluctuations in mood which may have a direct bearing on PK phenomena and are also closely linked to positive schizotypal behaviours. As such, it is proposed that these items should remain incorporated within the measures of the current thesis

3.4.2. Neurological Lability

It is known that the two hemispheres of the brain relate to different forms of cognitive functions, with the right hemisphere devoted to emotional aspects and attention and the left for motor functions and analytical activities such as speech and language. The majority of cognitive processes depend on the interaction between the two hemispheres. Emotional expression may depend on the right hemisphere, but the actual emotional state generated is reliant on the relationship between both right and left hemispheres. In the case of affective disorders such as bipolar the emergence of extreme states of either euphoria or depression involve the activation of opposite hemispheres (Edwards-Lee & Saul, 1999). In accordance, Heath (2003) proposes that the acute negative emotions often associated with spontaneous PK production may be associated with activity in the left hemisphere, rather than the right hemisphere. Furthermore, she proposes that psi performance may be produced from shifts in

activity between the two hemispheres - an idea closely relating to the theme of ease of change in lability.

The argument for lability within neurological and cognitive domains being highly influential to the experience of paranormal phenomena comes from studies of disorders in abnormal psychology. Schizotypy is to be found within perfectly functional members of the general population with no apparent adverse effects on general mental health (Day & Peters, 1999). Parallels have been drawn between the symptomatic characteristics found within schizophrenia and schizotypy, including delusional thoughts and the perception of unusual experiences (Beyerstein, 1996), and individuals reporting belief in and experience of paranormal phenomena (Hergovich, Schott, & Arendasy, 2008). Indeed, Anderson and Anderson (Anderson & Anderson, 1982) have devoted research investigating characteristics between hallucinations within schizotypal characteristics and those defined as 'veridical' (believed to be true) hallucinations in psi experiences, which are proposed to have many similarities. It appears that the content and sensory input allow for distinguishable aspects, with psi orientated hallucinations having multimodal visual, auditory and aesthetic consistency, whereas schizotypal hallucinations generally tend to be auditory, in which derogatory voices are likely to be heard (Stone, 1993).

Goulding (2005) has explored the juxtaposition of paranormal beliefs and experience being categorised as being both a sign of psychological ill-health and also psychological health. Aspects of positive schizotypy, such as auditory and visual hallucinations, can also be viewed from the perspective of anomalous occurrences. Yet, there is an assumption that those who experience such or have belief in paranormal occurrences will likely develop psychosis. Zusne and Jones (1982; 1989) have suggested that belief in different types of paranormal occurrences may act as a form of coping mechanism or, such as the belief in ESP, not considered detrimental to psychological health. Goulding (2005) sort to investigate the cluster structures of both the fully dimensional and quasi-dimensional models proposed for schizotypy using a sample of 129 persons who actively believed and have experienced paranormal phenomena. Cluster analysis was performed on the Unusual Experiences, Cognitive Disorganisation and Introvertive Anhedonia sub-scales of the Oxford-Life Inventory of Feeling and Experiences (Mason, Claridge, & Jackson, 1995), which is used for assessing schizotypy. Results identified three clusters labelled Introvertive Anhedonia, Low Schizotypy and Cognitive Disorganisation. No significant differences were found when compared with scores of paranormal belief and experiences from the Australian Sheep-Goat Scale (Thalbourne & Delin, 1993). Goulding (2005) concluded that these findings supported

the fully dimensional model of schizotypy which considers schizotypy to be on a neutral continuum with both healthy and unhealthy tangents.

Additional evidence has also been provided within a recent study by Holt et al. (2008) whilst exploring the associations between belief and experience of the paranormal using the Australian Sheep-Goat Scale (Thalbourne & Delin, 1993) and the relatively new concept of benign schizotypy, participants were categorised into four clusters and subsequently found that aspects of emotion and behaviour normally viewed as being detrimental within clinical populations were deemed positive, instead. The study found that individuals scoring highly on positive schizotypal traits, also scored highly on the majority of creativity scales. However, there has since been some dissension within recent years by other researchers as to the appropriateness of the scales and the methods of analyses used to garner these findings. Thalbourne (2010), suggested that the Transliminality Scale (Lange, Thalbourne, Houran, & Storm, 2000) may have been more appropriate. Plus, the exclusion of individuals scoring highly on Cognitive Disorganisation and Introvertive Anhedonia from the Unusual Experiences cluster appeared to skew scores within other clusters. This was further illustrated when post hoc correlations were conducted by the researcher on request using scores from the entire sample.

However, even with this in mind, there is cause to hypothesize an association between various symptomatic traits within known disorders, which appear to involve lability in emotional regulation, and the experience of psi phenomena. At this time, contrary to the approved doctrines of Western culture in particular, it may be argued that these perceptions and symptoms may not be solely attributed to specific neurological or cognitive disorders, but on actual occurrences.

Previous research has tended to investigate the relationship between the prevalence of schizotypal traits within clinical and non-clinical populations and concurrent belief in the paranormal. Unfortunately, there is less empirical information exploring the association of related paranormal experiences. Schofield and Claridge (2007) investigating the development of paranormal beliefs within schizotypal individuals, found that cognitive disorganisation was a moderating factor, intensifying the relationship between schizotypy and the subsequent interpretation of paranormal experiences as being either positive or negative. These findings are interesting regarding the implications of whether affective lability levels impact on the perception of paranormal experiences, as it is suggestive that high levels of cognitive disorganisation – or the impairment of segregating relevant and irrelevant stimuli – enhance

the capacity of an individual with non-clinical schizotypal features to perceive paranormal experiences.

As presented within the previous chapter outlining the background of experimental PK investigations attention has been given to individuals known to suffer from temporal lobe epileptic disorders who exhibit PK effects (Roll, 1978). Although firm conclusions remain tantalizingly elusive, interest in the possible association between neurological lability as defined by the fluctuations observed within bipolar and schizotypal disorders and PK manifestation has intensified, especially as with the introduction of new technology information no longer has to rely on purely subjective measures. Neppe (1983a) supports early research by Nelson (1970) investigating trance mediums using (at the time), relatively new EEG equipment and finding distinct activation within the temporal lobes - although it may be too early to state that this is evidence of neurological lability - even positing that there may be an inherent neurological source from which psi experiences stem. Alternatively, Persinger and Roll (1986) proposed that it was the lability of electrical activity within the temporal lobes apparent within epileptic disorders that is able to simulate what appear to be psi phenomena.

Within recent years and with greater access to innovative medical equipment, recordings using EEGs have observed distinct activity within the temporal lobes whilst individuals attempt to initiate PK effects as observed by Roll (2007) reviewing a series of seven RSPK case studies. These case studies are also illuminating in the use of psychological assessment on the possible individual agents, finding a trend in affective dysregulation, also. Roll (2007) has further proposed that as instances of RSPK appear to be in the large an unconscious projection, it is likely that processes within the autonomic nervous system (ANS) involved with arousal responses may necessarily be activated.

However, such persistence throughout the years of parapsychological investigations regarding the association between neurological processes and psi effects does not necessarily verify the connection or provide an explanation of whether psi is just a by-product of temporal lobe activity. Previous investigations have tended to focus more on individuals with recognised disorders, rather caused by dysregulation within neurological and cognitive processes as seen in schizotypal characteristics, which is also described as being an important feature of psi experiences (Roney-Dougal, 1986). In a study conducted by Roll (2007) participants were individuals already accredited as having alleged psychic ability. It was reported that at least two out of the seven people studied who exhibited psi effects were

known to have been diagnosed with the neurological conditions of Tourette's syndrome and epilepsy. Although it is inconclusive as to whether an individual being defined as 'labile' is correspondent with both psychological and physiological aspects, (including neurological functions), these findings may lend support to an earlier case study by Solfin and Roll (1976) involving recurrent spontaneous psychokinesis (RSPK) revolving around an individual agent known to have been diagnosed with epilepsy. Roll (1977) further expanded this line of research by testing a small number of participants with neurological disorders within a controlled environment with similar results of psi effects. Furthermore, de A. Montago and Roll (1982) offer a neurobiological model for PK effects by stating that reports of RSPK phenomena have similarities with the symptoms of psychomotor epilepsy (PME) which is associated with disturbances in the limbic system and activity in the temporal lobes. The researchers claim that direct comparisons can be made between the two phenomena, including the content of the occurrences; the mode of expression; and the period in the circadian cycle of occurrences. They suggest that RSPK emanates from unusual temporal lobe activity with the lobes being the hub of memory retrieval, cognition and potential behaviour within the environment. Consequently, the two differing types of RSPK activity – focused and unfocused – are proposed to relate to neuronal disturbances in separate areas of the limbic system in much the same way as epileptic seizure symptomology – unconsciousness with retained activities and major convulsions. Interestingly, de A. Montago and Roll bring to attention the idea of RSPK as an externalization of a functional disorder, such as epilepsy or 'hysteria'. In modern terminology, the use of 'hysteria' perhaps should be replaced with one of stress-related disorders. The researchers also propose that if this is indeed the case, then there must also be some form of physiological trigger that controls whether neurological activity is internalized or externalized. Such a proposal opens the door as to whether such a trigger could be that of the psychological construct lability which acts as a fulcrum as to the choice of neurological end product – either epileptic symptoms or RSPK. Furthermore, in relation to an individual's circadian rhythm, they suggest that as physiological and emotional arousal is associated with reports of RSPK, it is possible that the sympathetic nervous system plays a role. They argue that support for this proposal is from individual agents involved in RSPK are awake and functioning. However, this does not take into account that many agents report that they were unaware of being the centre of RSPK activity and are therefore not consciously triggering physiological processes.

This relationship between PK and neurological lability is further supported by Persinger (1985; Persinger & Makarec, 1987) in his research on the influence of geophysical variables on instances of epileptic seizure and poltergeist activity (discussed in the Chapter 1).

Simmonds (2002) has explored this association between induced dream-like and waking states further in an ESP study using the Ganzfeld technique of sensory deprivation. Twenty-six pairs of participants completed the O-LIFE (Mason, Claridge, & Jackson, 1995) scale to assess schizotypy and the PPI (Makarec & Persinger, 1985) in relation to neurological lability. Psi performance as an interval level variable was not found to be significant during the dream-like state ($z = .35$, $p = .72$, $r = .07$, two-tailed) or during a waking state ($z = .70$, $p = .48$, $r = .14$, two-tailed). There were no significant relationships found between schizotypy factors or neurological lability. Although concerned with ESP, these findings are nevertheless suggestive for use in PK research especially in regards to the reduction of external sources of noise as posited by the theories of Braud (1981).

However, although parapsychological investigations do now have greater access to suitable EEG equipment with which to observe activity, design constraints still necessitate the use of appropriate scales to gauge individual aspects of temporal activity. In this vein, previous research (Holt, Delanoy, & Roe, 2002), has utilised the Personal Philosophy Inventory (Persinger & Makarec, 1987), a 16 item measure specifically developed to assess characteristics that are often symptomatic of epileptic disorders, including items relating to unusual sensory experiences.

3.4.3. Creativity and Lability

The concept of creativity has defied attempts by researchers over the years to offer a complete definition and is acknowledged as being a construct of many and overlapping layers (Runco & Sakamoto, 1999). As such, it would be redundant for the author to offer a complete review of the exhaustive literature on creativity within this thesis. Instead, this section offers research that encompasses creative aspects commensurate with those of lability. Amabile (1983) describes creativity as generating the production of original ideas, problem-solving and insights. At first glance, creative and labile processes may not share the common denominator of ease of change, but on closer examination comparable theoretical characteristics between creative phenomenology and lability can be discerned. Supporting this concept are Nijstad et al. (Nijstad, De Dreu, Rietzschel, & Baas, 2010) who describe creativity as comprising of two main factors – that of flexibility and persistence. Flexibility within creative thinking employs a wide range of cognitive capacities and the ability to create

new connections between concepts and variables that may not initially have been considered (Friedman & Förster, 2010). Both elements rely on a moderate increase in physiological processes such as heart rate which also enhance levels of creativity (Baas, De Dreu, & Nijstad, 2011). Therefore, the premise that any state that leads to an increase in physiological and cognitive processes predicts aspects of creativity reinforces the connection between creativity and lability. Examples of this can be seen in the inspirational ‘Eureka’ moment stemming from the sudden generation of an idea normally following intense periods of cognitive effort; the consistent ease of ideas for the creative person and in opposition, the lack of originality conceded by others. In fact, Stanford has also expressed in his CBM that conformance behaviour is apparent within normal cognition and further, that there is the possible involvement of conformance behaviour with some of the creative processes (Stanford, 1980).

Due to the ambiguous nature of creativity, it is useful to appraise the associations creativity has with labile affective aspects which have already been thoroughly researched. It has been popularly accepted that there is an ‘artistic type’ of personality and that these individuals are prone to heightened sensitivities, emotional reactions and psychopathology beyond the realm of the general population. Research in the domain of clinical psychology has supporting evidence that there is a great range of creativity within bipolar disorders which is characterised by intense cyclic affective states fluctuating from depression and hypomania. It has been acknowledged that creativity is dependent on an individual’s mood, with enhanced creativity predicted by positive states such as happiness (Baas, De Dreu, & Nijstad, 2008; Forgeard, 2011). Instances of extreme positive affect occurring with the hypomanic cycle of bipolar disorders are suggested by researchers to be associated with creative dispositions (Murray & Johnson, 2010). However, there should not be the assumption that creativity cannot be predicted by negative mood states. The impact of negative states on aspects of creativity is possibly far more complex and many researchers have offered that creativity could actually be enhanced by such – examples include creative giants such as the artist William Blake whose productivity was heightened during bouts of depression (Akinola & Mendes, 2008) and the novelist Anaïs Nin, who coped with a personality disorder and schizotypy traits which have strong associations to creativity (Kehagia, 2009). Schildkraut et al (Schildkraut, Hirschfeld, & Murphy, 1996) found that in a group of New York abstract artists that levels of affective disorders and suicidal behaviours were ten times higher than that of general population. In addition, Akiskal & Akiskal (1988) in a study assessing the associations of creativity and bipolar disorder found that fifty percent of artists suffered from

depressive episodes and over two thirds from hypomanic behaviours. Such findings supporting relationships between creativity and disorders synonymous with affective lability have been based on small, selective populations or retrospective analysis. However, further research based on the Epidemiological Catchment Area Study using 20, 861 adult participants found that there were greater numbers of individuals diagnosed with a bipolar disorder who declared that they were in an 'artistic' profession (Tremblay, Grosskopf, & Yang, 2010). Baas et al. (Baas, De Dreu, & Nijstad, 2011) theorise that angry states are also beneficial to creativity, with the generation of ideas having a relationship to competitiveness and frustration. However, so far researchers have been unable to find evidence as to why anger states are more stimulating for creativity than other negative states such as sadness, and propose that time is an important factor. An angry state is observed to have a shorter duration than sad or depressive states and so offer an argument for short, sharp bursts of creativity. And yet, creative persons are deemed as being more gregarious and sociable overall with increased levels of extraversion – another similarity with the hypomanic phase of bipolar disorder. Furthermore, Srivastava & Ketter (2010) found that both persons diagnosed with a bipolar disorder and involved within a creative profession have strong positive relationships between creativity aspects predicted by the personality trait openness to experience. Overall, the research has offered support for the cyclothymic mood swings of bipolar and affective disorders being associated with creativity. In addition, there is a logical premise for lability, seen within the extreme fluctuations in affective states, having commonalities with aspects of creativity.

It appears that it is the aspect of emotional creativity, as defined by Averill & Thomas-Knowles (1991), as the ability to experience and outwardly express original, appropriate and authentic combinations of emotions that is the most pertinent to the concept of lability. Contextually, emotional creativity relates not to the awareness of one's emotional landscape, but to the intensity and complexity of emotions, without regulation (Ivcevic, Brackett, & Mayer, 2007). As a construct it is categorised by three criteria – that of novelty, effectiveness and authenticity and therefore comprises of an adaption of common emotions and generation of new; appropriateness for the situation and an honest expression of values. Furthermore, Averill (1999a) found that it was the novelty component of emotional creativity that correlated positively with the personality trait of openness to experience. Emotional creativity presumes that an individual is emotionally prepared, with the subsequent expression reflecting understanding and willingness to explore emotional fluctuations. Interestingly, emotional creativity has strong associations with the individual experiencing a greater degree

of emotional experiences ranging from the traumatic to everyday stress (Averill & Thomas-Knowles, 1991). It also emphasizes the uninhibited expression of emotion within social situations.

The apparently strong relationship between such personality aspects and psi activity has captured the imagination of researchers within parapsychology, especially when significant findings are able to be replicated (Holt, 2007). Creativity was first theorised to have a strong association with possible psi phenomena as an adaptive trait it appears they require similar conditions to flourish, including interpretation of contextual cues, oneiric and sensory cues (Sondow, 1987). Parapsychologists attempt to explore this dimension further by investigating individuals with particularly creative professions or hobbies and the relationship with psi experiences (Schlitz & Honorton, 1992; Dalton, 1997), although it is unclear as to whether different types of creativity are more amenable to psi expression than others. In relation to lability, although associations can be drawn between the highly creative and the highly labile mind, it does not necessarily equate that creativity and lability have the same characteristics. In this vein, research is reviewed in an attempt to discern why aspects of creativity may be important to the investigation of lability.

In particular, research investigating aspects of creativity within assigned individual 'sender' and 'receiver' participants within ESP Ganzfeld studies has thus proved to be popular and just as consistent. A study following this line of enquiry was conducted by Roe et al. (2001), in an attempt to address the lack of research regarding the role of the 'sender'. The study theorized that high levels of creativity may act as a reliable predictor of psi performance as previous research achieved significant results when using participants belonging to different creative professions, including actors, artists and musicians (Schlitz & Honorton, 1992; Dalton, 1997). The study utilised a battery of measures including the Torrance Tests of Creative Thinking (TTCT), (Torrance, 1974) and the Revised Sheep-Goat Scale (Thalbourne & Delin, 1993). However, although findings did not reach significance, a definite trend could be observed within the creativity subscales which suggested that the two roles of 'sender' and 'receiver' relied on different aspects of creativity.

Although, in regards to methodology, it would appear from previous studies that attempting to judge the relationship between PK and aspects of creativity within the general population would be via psychometric testing and the use of self-report measures. If, as Anderson proposes (1962), creativity is found to relate strongly with the occurrence of psi phenomena, including PK, it may not necessarily follow that it equates with lability. As

opined within the above study, being a member of a creative profession does not necessarily equate with having highly creative tendencies – ‘artists’ may lack flair and rely on formulaic productivity – whereas, individuals within an apparently unimaginative vocation may still possess imaginative style. Already touched upon briefly within this section, there are several acknowledged features comprising creativity as a whole, suggesting that it may be lability within certain aspects of creativity that are the key contribution to psi effects. It has been in following this avenue of enquiry that researchers have further isolated two aspects of creativity – emotional and cognitive – that appear to be the most promising in regards to not only developing the construct of lability, but also to better understanding the processes that may be involved in psi and PK manifestation in particular. With this in mind, Holt and Roe (2006) created a blind study exploring ESP and PK effects, which used clips from films to elicit different emotional responses and a set of corresponding descriptive statements from which the participant ‘sender’ had to choose was most appropriate. In an attempt to control lability, the clips were selected using three different levels of randomness within an RNG – Table (low, sourced from a static table of numbers; Pseudo (moderate, sourced using an algorithm); Live (High, sourced from true randomness). Lability within participants was assessed using a number of measures assessing levels of individual differences deemed constructive for lability, including the five aspects of the NEO Five Factor Inventory (Costa & McCrae, 1992); The Personal Philosophy Inventory, (PPI), (Persinger & Makarec, 1987); and two aspects of creativity – The Emotional Creativity Inventory (ECI), (Averill, 1999) a 30 item scale focusing on preparedness, novelty, authenticity and effectiveness; and The Creative Cognition Inventory (CCI), a 29 item scale developed by the researcher (Holt, 2007). Based upon the theories of Braud (1981) and Stanford (1978) regarding PK effects generated via the interaction between the randomness of systems, a crucial hypothesis confirmed was that there would be a significant inverse interaction between individuals deemed as having low lability and the Live RNG, due to such stable characteristics conforming to the stronger dysregulation of the Live RNG system $F(4,74) = 4.959, p = .001$ – findings that were also mirrored (although not significantly) in the interaction between highly labile individuals and the Table RNG and between both moderate system levels. It has been from promising results such as those above that have opened a new avenue of exploration in manipulating lability levels in order to gauge the effects on PK performance within a controlled environment, in an attempt to better understand possible inherent processes.

The usage of selected scales with which to gauge lability within the above study was justified by findings from previous research, some such as temporal lobe activity and aspects

of creativity have already been discussed. However, it is argued that the impact of individual personality on PK intention has not been given the attention it may deserve either within an experimental environment or in real-world occurrences (Nelson & Dobyns, 1989; Roe, 1996). In addition, the importance of relationships between personality types and psi effects was highlighted even with the early days of parapsychological investigation with Nash and Richards (1947) whilst investigating the impact of distance on PK performance. Therefore, the inclusion of the personality trait Openness to Experience within the initial survey of this thesis needs further elucidation as to why it may also be pertinent for assessing individual lability and the production of PK effects; especially as within the above study, Neuroticism had been initially viewed as being an indicator of emotional instability.

3.4.4. Openness to Experience and Lability

Using ESP studies, Rao (1965) has provided some elucidation as to the possible personality aspects associated with either successful psi hits or psi missing effects. In viewing PK as having what appears to be opposing mechanistic properties to ESP, it is interesting to view the descriptive terms used relating to psi missing effects, which are primarily perceived as being negative – for example, frustrated, having heightened sensitivity, being repressed – terms also commonly associated with protagonists within poltergeist activity. However, descriptive terms for successfully directed psi hits include being sociable and easy-going, adventurous, also associated with the personality trait Openness to Experience.

Isolated as one of the five major personality factors inherent within individuals theorised by Costa and McCrae, Openness to Experience (OE), is able to be measured by the subsequent development of the NEO Personality Inventory (1992). Described by McCrae and Costa (1997) as:

“...a recurrent need to enlarge and examine experience.” (p. 825)

It appears to consist of six separate facets – fantasy; aesthetics; feelings; actions; ideas; and values and throughout psychometric personality research, for individuals to have high levels of OE is viewed with positive connotations and involves capacities of active imagination, aesthetic sensibilities and curiosity. It is via this combination that therefore enables such individuals to naturally seek new experiences or be open to different ideas, such as belief in paranormal occurrences. In addition, OE has a particularly strong relationship with creativity via an aspect of intelligence called crystallized intelligence or the ability to use skills, knowledge and experience to an advantage (Geary, 2005). McCrae (1994) has even

suggested that boundary thinness, such as that defined within the theory of transliminality (Thalbourne, Bartemucci, Delin, Fox, & Nofi, 1997), may act as a mechanism for OE.

Findings from the study by Nelson & Rawlings (2010) suggest that reduced inhibition found within schizotypal behaviour spectrums is marked by high levels of openness to environmental stimuli, regardless of any previous experience with similar stimuli (see section 3.4.2.). This finding follows the neurologically based concept that there is some form of underlying mechanism that prevents individuals reacting to stimuli which have no perceived emotional or motivational valence. If OE does have any commonalities with lability it is possible that it would be through such a mediating mechanism. In this instance, lability would be viewed as the consistently impulsive reactions triggered by stimuli. Furthermore, it has been tentatively suggested by genetic research that the spontaneity exhibited in schizotypal behaviour may have evolved as a positive adaption as it is linked to heightened aspects of creativity (Crespi, Summers, & Dorus, 2007). In addition, Nelson & Rawlings' (2010) study used participants from a range of artistic disciplines and found that they had distinctly higher levels of openness to experience and 'positive' schizotypy traits, plus elevated levels of boundary thinness compared to the general population.

In regards to parapsychology, research on the relationship of OE levels has mainly focused on the development of spiritual beliefs, observing that throughout the spectrum, it is those persons falling within the extreme levels of high and low OE that are able to be defined readily, with those with low levels being ultra conservative and very traditional in their chosen views, whether in a normative cultural religion or in the paranormal (Aarnio & Lindeman, 2007). However, within the realms of experimental psi investigations, a precursory study by Roe and colleagues (Roe, Holt, & Simmonds, 2003), investigating PK effects using Ganzfeld techniques managed to obtain only a non-significant negative correlation between OE and successful psi performance ($r_s = -.26$, $p = .106$, two-tailed).

Berger et al. (1986), employing computer generated psi games within experimental methodology to assess PK performance, and also using scale measures, observed that participants defined as being 'feeling' were more likely to achieve higher effect sizes, as opposed to those categorised as 'thinkers'. Another study by Roe et al. (2003a) investigating PK performance using a greyhound racing RNG task explored participant disposition using the Kiersey Temperament Sorter (1978) and categorised as either 'Feeling', 'Perceiving', 'Judging', 'Thinking' with subsequent paired combinations, such as 'Judging/Perceiving'. However, despite basing objectives on previously significant correlations between

‘Feeling/Perceiving’ types having higher PK performance (Roe, 1996), results for this study remained inconclusive (standardised z -scores = 0.015 to 1.334).

This prevalence within related findings is suggestive that individuals high in OE are more sensitive to novel experiences and are comfortable to be passively involved, rather than try to initialize logical actions or cognitive processes in an attempt to clarify an ambiguous situation. There is the additional support from the research associating correspondingly high levels of OE and paranormal belief, which has also been shown to have a strong relationship with the subsequent experience of psi phenomena, which is discussed further in the following survey chapter

3.4.5. Lability and Stress

By aiming to understand the nature of lability, the following section reviews the nature of stress in regards to the influence on mental and physical processes. The relationship between arousal caused by exposure to a stressor and coping strategies is explored. Support will be given for the theories proposing a relationship between abnormal stress responses and RSPK and poltergeist activity. Comparisons between symptoms of neurological and cognitive disorders and psi effects are given.

Within recent years, the impact of traumatic stress on emotional, behavioural and even physiological factors following acute or chronic incidents has become pertinent with the prevalence of active combat (Dekel, Solomon, Elklit, & Ginsburg, 2004). Initially unrecognised, the onset of stress-related disorders and development of further psychopathology has now become a line of inquiry in its own right (Ford, 1999). Kashdan et al. (2006) have argued that conflict veterans suffering from posttraumatic stress disorder (PTSD) who are unable to control emotional instability are more prone to develop further psychopathology than individual veterans without PTSD who are able to manage emotional responses. Further support of this research identifying lack of control within highly labile emotional levels is offered by Ziegler-Hill and Abraham (2006) in a study conducted with individuals suffering from borderline personality disorder (BPD). The initial hypothesis that such individuals would produce strong labile emotional reactions with exposure to daily interpersonal stress was verified and therefore, negative subjective feelings of self-esteem and affect were highly unstable. Although, these conclusions can be considered interesting in relation to theories proposed within the previous section regarding the psychological profile of individual agents involved in poltergeist activity, it must be observed that a significant feature of BPD is the inability to control aggressive tendencies (Latalova & Prasko, 2010) –

opposing the emotional suppression theory within poltergeist research. Furthermore, Koenigsberg et al. (2002) successfully explored lability within patients with BPD in an attempt to define characteristics, discovering significantly greater labile levels within anxiety and anger ($F = 8.72, p = .004$) and evidence of easy fluctuation between negative aspects of depression and anxiety ($F = 10.88, p = .001$), as opposed to between extremes of negative and positive aspects of elation.

Currently, attention has become focused on the severity of mood lability and emotional lability (EL) and the possible predictive value for the onset of certain disorders, stemming from the premise that the influence of mood on cognition is mainly due to inherent individual differences. Recent research by Miller and Barnett (2008) investigating the prevalence of the rare paediatric bipolar disorder has observed correspondingly severe mood and behavioural disturbances. Further in this line of study is research by Galanter et al. (2009) who conducted a survey specifically with child and adolescent psychiatrists who agreed in the majority that lability (within moods, emotion and behaviours), was a significant correlate to bipolar disorder. It is apparent that not only high levels of lability are significant within the symptomology of such disorders, but also the magnitude and intensity of affective states, supported by the research of Henry et al. (2008) investigating affect lability and intensity as core dimensions of bipolar disorder during non-depressive episodes. A study conducted by MacKinnon and Pies (2006) has expanded this further by theorising that bipolar and BPD disorders which share the common symptom of extreme affective lability are only truly distinguishable by individual differences in background, behaviour and temperament.

Further research which has direct implications for the production of PK effects presented within this thesis focuses on the role affective lability plays in maladaptive coping behaviours. A study recently completed by Anestis et al. (2009), has explored this premise in females diagnosed with eating disorders (acknowledged as an abnormal coping strategy), and discovered that the degree to which individuals experienced labile emotions corresponds to other indicators of maladapted behaviour, concluding that high lability levels were predictive of a severely dysregulated behaviour profile.

In addition, Thompson et al. (2009), explored the relationship between affective instability (lability) consisting of intensity and variability and two aspects of emotional awareness – attention to emotion and clarity of emotion using data collected from three large separate samples - one and three from within the area community and the second from the student body. Scale measures were employed to assess trait levels of affective lability using

the Affective Lability Scale, (ALS), (Harvey, Greenberg, & Serper, 1989) a scale of fifty-four items of which six subsections explore depression, anxiety, elation and euthymia (non-depressive mood state), which has good test/retest internal reliability; affect intensity using the Affect Intensity Measure, (AIM) (Larsen, Diener, & Emmons, 1986); Neuroticism using IPIP (IPIP, 2001); affective instability using Personality Disorder Interview-IV, (PDI-IV), (Widiger, Mangine, Corbitt, Ellis, & Thomas, 1995); attention to and clarity to detail using The Trait Meta-Mood Scale, (TMMS), (Salovey, Goldman, Turvey, & Palfai, 1995).

Although findings for both the community samples resulted in a positive correlation with attention to emotion ($r = .20/ r = .17$), there was a corresponding negative relationship with clarity of emotion ($r = -.23/ r = -.45$). This is suggestive that high emotional lability levels are associated with a conscious elicitation of strong emotions. Yet, there are detriments in knowing which emotion is actually being produced, for example exhibiting fear/anger/excitement. What is of interest in relation to the thesis is that this may correspond to individual PK agents being unable to recognize their own emotional responses leading to unconscious suppression of normally labile affective states, this mediating PK effects.

Related to this theme is a study conducted by Miller et al. (2009) into the less examined role of affective lability within a broader context of personality functions of the Five Factor Model. The findings summarise that neuroticism and negative affect lability are closely related as constructs, although still with uniquely individual factor features. What is of further interest is that the externalizing facets of trait neuroticism – angry hostility and impulsivity, again – also have a strong relationship. Furthermore, the impact of time may be of significance as Larsen (2009) has observed that negative affective states have a longer duration compared with positive states and have greater intensity of emotion. These findings coupled with an individual's difficulty in managing such labile negative states may be a factor in RSPK and poltergeist activity.

Gracanin et al. (2007) discovered interesting and possibly pertinent results when investigating the relationship between individual physiological responses to both positive and negative affect stimuli. Findings suggest that individuals with high levels of negative affect also exhibit correspondingly high levels in electrodermal activity and heart rate. Conversely, individuals with lowered affect levels also had simultaneously low physiological response levels. These results may have relevancy for the thesis, by observing that lability is possibly demonstrated within various individual differences and positive schizotypy traits when exposed to stimuli. This would then add further support for lability to be applied as a

personality trait with an individual described as being ‘labile’ (displaying lability within a range of individual differences), as opposed to exhibiting a labile state within a given situation. In addition, the findings also support the premise within the thesis that PK manifestation corresponds with high levels of physiological arousal due to subjectively perceived stress and a subsequent ill-managed coping response.

In addition, recent research by Moscovitch et al. (2010) exploring related connections between affect and physiological responses within patients with social anxiety disorders and non-anxious controls discovered similar results. Increased levels of heart rate and skin conductance corresponding with high negative affect were observed in patients, whereas, opposing results were found in the control participants who experienced increased heart rate with only a positive affective state. Again, implications are discernible in why PK effects may only be manifested around particular individual agents. If certain individuals inherently possess labile traits, this could possibly predispose them either to connect directly with the external environment via PK effects or, alternatively, act as a predictor of underlying stress disorders which then act as a catalyst for PK manifestation as an abnormal coping response.

3.5. A Case for the Labile Person?

In his work ‘The Nature of Human Conflict’, (1932) the Russian psychologist Luria suggested that there were two known overall personality types – that of the labile and stable personality, with the former favouring high levels of neuroticism and more likely to experience a breakdown and the latter with low levels of such neuroticism. For Luria, a labile personality also exhibits heightened reactivity in their motor control and ‘neuropathic defects’ (p. 74) causing the individual to react with inappropriate intensity when faced with a stressful situation. Here, lability is an influence observed within personality traits, emotional and affective states, motor control and the nervous system, akin to the proposition within this thesis. However, the enormous difference between the two proposals is Luria’s assumption that lability is synonymous with neuroticism and hysterical tendencies with ‘normal’ individuals exhibiting moderate levels of lability. He presents lability almost as an affliction for the individual with its insidious effects supporting the negative connotations of a person deemed as labile. And yet, Luria also gives thought that lability is a connecting process with different degrees of lability linking the effects of an external stimulus (in his case trauma) to individual motor, psychological and behavioural responses – a concept easily accommodated by the research in this thesis.

In a discussion panel with Stanford, Robert Morris paraphrased Howard Thrasher's description of individuals with supposed good psychic abilities as:

"...people who are relatively disorganized...their thought processes are basically pretty disjointed...they come out with disjointed imagery, which had really good material in it. You will never hear about these people because they're too disorganized to teach classes, get students, write a book, be written about or go commercial." (Stanford, 1980, p. 100)

Such a description does show support as to the characteristics of an inherently labile person, with obvious aspects of randomness observed in psychological and cognitive and creative processes which would consequently impact on the individual's behaviour.

3.5.1. A kinetic model of lability

However, the author proposes that although lability may be observed throughout a range of individual differences, such neurological processes, emotional affect, physiological arousal and creativity, their levels may not be similar at all. In plain speaking, having high levels of lability within creativity and openness to experience may not correspond to high neurological lability. As queried previously by Morris in his discussion with Stanford, does being recognised as a 'labile' person equate with observed lability within only a few domains? This proposal argues for lability to be assessed as a spectrum with levels of individual lability perceived across a range of processes. As with other spectrums such as in the Autistic Spectrum, although persons recognised as being labile may share commonalities they would necessarily exhibit differences unique to the individual. Such a range of intraindividual variability could provide a logical answer for an observed range of interindividual variability. It would be interesting for an assessment for a labile personality to necessarily include persons reported to have psi abilities and to combine qualitative reportage from personal experience with quantitative findings from self-report measures.

As can be seen in Figure 3.1 lability is employed as the mechanism which allows interaction between the three main areas of person, processes and place, which takes its cue from Storm and Thalbourne's theory (2000) that the three main factors for the production of psi effects are - the self, a positive attitude and optimal conditions. It is the contribution of lability inherent within an individual's various psychological and physiological processes influencing external labile systems that may act as a catalyst to the production of PK phenomena. The lability of external systems, such as an RNG in an experimental situation, can be controlled and manipulated through different levels in order to suit research

requirements. However, exploring the concept of lability within the various regions of human processes would benefit research by also adding an element of control in relation to individuals being defined as being either highly labile or having low lability. Such a model perhaps should be interpreted via a statement made by Putnam (1973), whereby any system may be deduced from its comprising elements, although it may not be fully explained. Therefore, as is the case with other psychological processes, individual lability is likely to be multi-factorial and it would benefit our understanding of the construct to identify and explore these component factors.

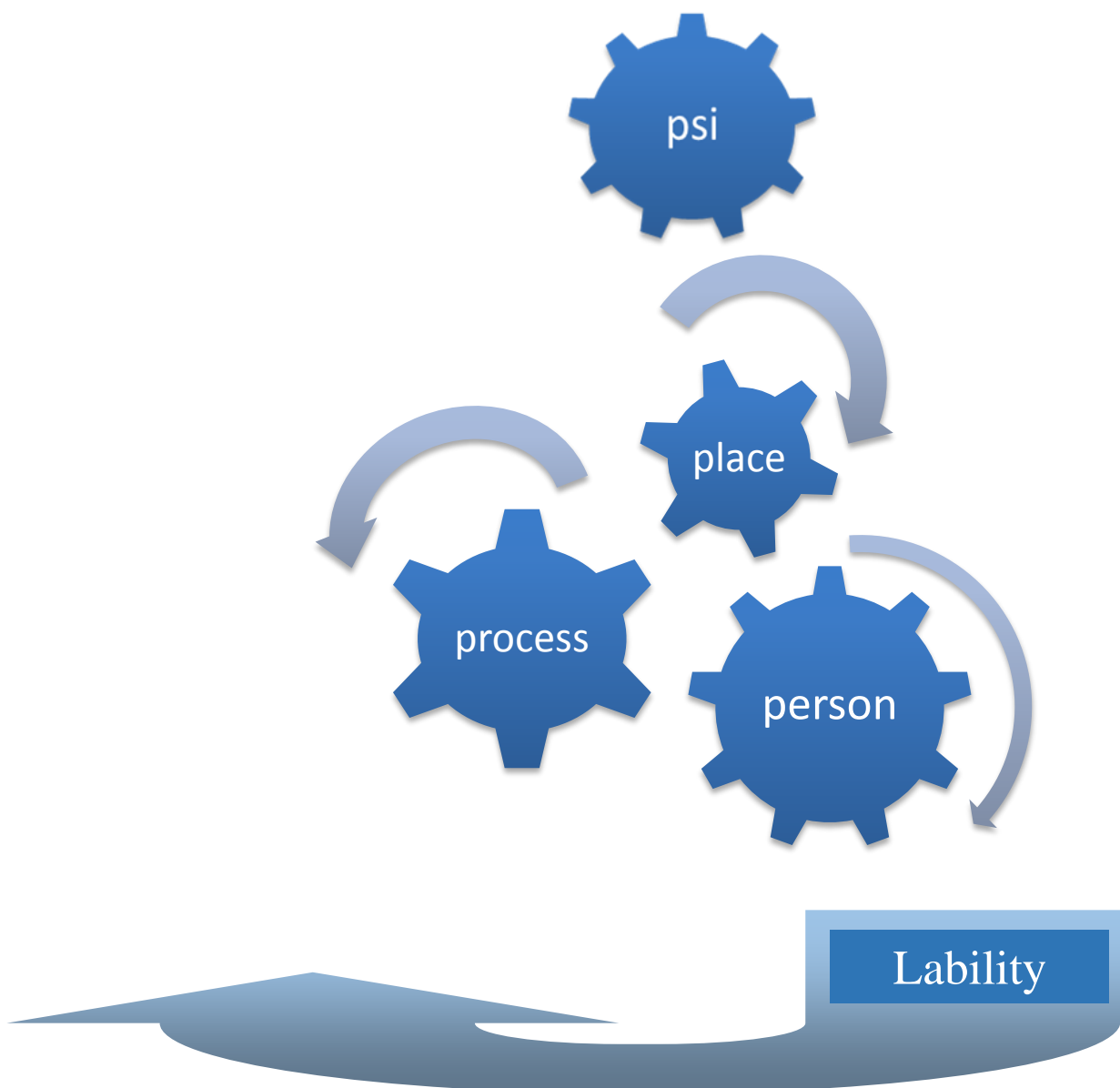


Figure 3.1 A schematic model of the lability contribution in relation to the production of PK effects

3.5.2. Chapter Summary and Conclusions

In summary, the use of lability was adopted by various psychological domains such as health, cognitive, personality and biophysical and used as a descriptor for fluctuation. As such, lability has most often been synonymous with the dysregulation found in personality, affective and behavioural disorders and has therefore, been attributed primarily with negative connotations. In an effort to integrate the different definitions of lability used in psychology, a common theme of an ease of change was identified. To facilitate research on PK, the author offers that lability is theoretically conceptualized as an ease of change within individual processes and systems and as both a trait and a state, because it is presumed to vary both in and between individuals.

Within parapsychology, lability has been suggested as a contributing variable in the production of psi effects – both for ESP and PK. It is apparent from promising results gained from recent experimental PK-RNG research that the concept of lability has opened a new and exciting avenue of enquiry, capable of replication and elaboration. This holds especially true in regards to the interaction between opposing levels of lability between two systems, the impact of individual differences and experiences, and also the environment in regards to cognitive and sensory interference (Storm, 1998). Consequently, within this chapter a schematic model for how lability may interact with individual experiences and values, individual difference processes and the environment has been presented. It is from this basis that out of the presented theories regarding lability within parapsychology, it is those of Braud's 'noise reduction' hypotheses (1980), that are deemed most pertinent in regards to the research within this thesis, with the aim of fully realizing a working model regarding the role of lability within PK effects.

Essentially, the preliminary psychological studies outlined above have demonstrated that use of the term lability is often used in conjunction with either primarily negative connotations within the dysregulation of emotional affect - symptomatic within bipolar, dissociative and depressive disorders - or as a process with which to regain a desired, secure stability within a system. In addition, the degree of lability within such processes is apparently dependent upon both internal and external factors regardless of any predictive rationale. It has also been observed that subjective reports of spontaneous highly traumatic events have the ability to act as a catalyst in temporarily increasing lability levels in individual differences, such as within emotional, cognitive and physiological processes, although it is still unclear as to the underlying reasons.

Findings from the research outlined within this chapter have observed that labile capabilities within such individual differences may correspond with each other, lending support to the concept that an individual may ultimately be defined as being ‘labile’. This is apparent when exploring affective states or emotional states, physiological arousal; neurological processes; aspects of creativity and personality factors. Many of these specific individual differences have also been related in previous research to experiencing psi phenomena. However, a lack of research aimed at exploring PK means that cues can only be taken in some instances from related ESP research. Yet, this still lends support to the research proposal within this thesis that a labile quality of certain individual differences mediates PK effects – rather than the individual difference itself.

Lability or unstable emotional affective regulation is an acknowledged symptom of related disorders and the non-clinical aspects, such as bipolar, schizotypy and borderline personality disorder (BPD), which has been shown via measurable scales and EEG techniques to have distinguishable and similar neurological activity to creativity. These findings are also suggestive of the prevalence of such highly affectively labile individuals also having high levels of paranormal belief – possibly as a coping mechanism - or from subjective personal experience, of which warrants further research (Rao, 1974). The theory of transliminality may have implications for the concept of lability, in referring to the ease to which psychological material is able to penetrate back and forth between a conscious and unconscious state in an imperceptible manner (Thalbourne, Bartemucci, Delin, Fox, & Nofi, 1997). It has been posited that such a flow occurs continuously, but under novel circumstances the rate or magnitude of flow intensifies, thus causing the subsequent projection of PK.

3.5.3. *Transliminality*

In order to offer a theoretical background for the concept of lability, it is also deemed necessary to include a review of the theory of transliminality, as it has observable similarities in regards to movement within psychological systems and further, as a possible predictive factor of psi phenomena. Initially conceptualised by William James (1902, reprint 1982), at the beginning of the twentieth century as an acute sensitivity within an individual to psychological stimuli originating either from the unconscious or exogenous sources in the environment, the actual term ‘transliminal’ was brought into usage in relation to the fluid movement or ‘leakage’ between conscious and unconscious states a few years later by Usher and Burt (1909). Rather than a ‘stop-start’ process, it is hypothesized that transliminality is a

more consistent, two-way flow (sometimes imperceptible), of psychological material between the two states. Such claims are supported at a basic level by research into memory and perception and the integration of past and present, where theories of habituation rely on an automatic switch between a conscious awareness of activated cognitive processes into an unconscious continuation (Libby & Eibach, 2011) – it must not be forgotten that perception of even external stimuli, occurs firstly with the brain interpreting sensory input unconsciously, which is then forwarded by the cognitive processes into conscious action.

Subsequently, further interest in such a capability was taken by parapsychologist Michael Thalbourne who defined transliminality as “the ability to cross the threshold” (1996, p. 129) and consequently identified the new construct of Transliminality via factor analysis of different measures including paranormal belief, magical ideation and creativity amongst others, which subsequently loaded on a single factor (Thalbourne, Bartemucci, Delin, Fox, & Nofi, 1997). The initial Transliminality scale showed significantly high correlations with related scales of schizotypy, psychoticism, fantasy proneness, absorption and hyperaesthesia. Consequent refinement of the items correcting for age and gender, lead to the development of the 17-item Revised Transliminality Scale ($\alpha = .82$), (Lange, Thalbourne, Houran, & Storm, 2000). Findings from this revision suggested that processing sensory experiences such as brightness, sounds and smells have commonalities with aspects of magical ideation, mystical experience, absorption, hyperaesthesia (increased physical sensitivity), manic episodes, interpretation of dreams and fantasy proneness. Thalbourne and Delin conducted a survey study of the correlates of paranormal belief discovered a common underlying factor as:

“...a largely involuntary susceptibility to, and awareness of, large volumes of inwardly generated psychological phenomena of an ideational and affective kind” (1994, p. 25).

In addition, Storm and Thalbourne (2001a; 2001b) investigated relationships between personality factors and transliminality using the I Ching as a PK task as replications of an earlier and somewhat successful study (1998). Participants ($N = 93$) rated sixteen two word descriptors to describe their cognitive and emotional state and then threw three coins six times to represent one of the sixty-four hexagrams of the I Ching. After the task, participants then completed the self-report measures of the initial 29-item Transliminality Scale (Storm, 1998) and the 16-item Personality Factor Questionnaire (Cattell, Eber, & Tatsuoka, 1970). Results showed significant correlation between transliminality scores and six personality factors in relation to successful hits. However, many of the results failed to replicate those of the earlier

study. The researchers explained the successful findings as being caused by ‘psychopraxia’ defined as:

“...the self bringing about goals in the mind-body complex or in the wider world” (Storm & Thalbourne, 2001b, p. 303).

This theory of psychopraxia obviously has many similarities to those offered for the mind matter interaction that has now become synonymous with PK effects.

Soffer-Dudek and Shahar (2009) have continued this particular theme further by exploring sleep-related experiences (SREs) and the possible relationship to dissociative states and aspects of schizotypy. This research has distinct similarities to the nocturnal psi receptive research conducted by Braud and Braud (1979) mentioned in the previous chapter and uses as its root Stanford’s theory of a dreaming-state being conducive to psi via lack of cognitive interference (1977b). Sleep experiences encompass a variety of manifestations, including nightmares, lucid and problem-solving dreams and it was with these aspects that cross-correlational analyses were performed with history of childhood trauma, life stress and dissociative and transliminal tendencies. Findings observed that SREs are an overall product of perceived stress and that trait transliminality was deemed as a longitudinal predictor of SREs and lucid dreams and could be accountable for any apparent individual differences. These findings add additional support to the concept that there is an underlying trait which acts a mechanism to allow the passage of psychological material to flow between the differing states or boundaries of consciousness (Watson, 2001). Further, it expands on research also performed by Thalbourne, which has previously correlated transliminality with a sense of depersonalisation and also with the recall of dreams (Thalbourne & Delin, 1999; Lange, Thalbourne, Houran, & Storm, 2000; Thalbourne & Houran, 2000) and which appear to tally with processes involved with psi experiences. Further, another connection has been provided between possible psi processes and stress related effects, which may allow for heightened levels of transliminality as a by-product of an underlying stress-related disorder acting as a catalyst for PK occurrences, as theorised in the previous chapter. What is of particular interest, is that during a sleep or unconscious state theoretically personality factors should not be integral to any concurrent experiences – although physiological factors may still play a role (Buss, 1989). Interestingly, the Soffer-Dudek and Shahar (2009) study also proposes that SREs may be a manifestation of a maladaptive coping response.

Furthermore, the relationship between stress responses and transliminal flow may correspond to restrictions observed within memory capacity for information- processing. This

idea proposes that exposed to stress, the subsequent transliminal leakage of psychological material between mental states would be due to restricted cognitive capacity, as priority would be given to instigating appropriate unconscious and conscious coping strategies and may facilitate PK effects (Mandler, 1982).

In addition, Thalbourne et al. (2003), using the Revised Transliminality Scale (Lange, Thalbourne, Houran, & Storm, 2000) and items investigating temporal lobe epileptic signs derived from the Personal Philosophy Inventory (Persinger & Makarec, 1987) have been able to show definite temporal lobe correlations within highly transliminal individuals ($r = 0.72$), whilst in another recent study, Fleck et al. (2008) used EEG imagery to explore neurological activity within individuals assessed as either having high or low transliminality using the Revised Transliminality Scale (Lange, Thalbourne, Houran, & Storm, 2000). There were noticeable alpha, beta and gamma decreases in the left posterior cortex in persons with high transliminality and greater power in the right superior temporal region, offering support for a theory of definite trait transliminality. Furthermore, these findings add to research presented of a predisposition to disorders such as schizophrenia and the development of paranormal beliefs and interpretation of experiences. The study concludes in suggesting that further research should concentrate on exploring the basal neurological processes in regards to trait transliminality and aspects of schizotypy and creativity.

3.5.4. Transliminality summary

The above section has discussed the concept of transliminality - the apparently continuous flow of psychological material between the conscious and unconscious states (Thalbourne, 1996), which may be a possible candidate in identifying individual attributes that impact psi effect and which also shares the attribute of change common to the concept of lability. The nature of transliminality already has much in common with acknowledged cognitive processes such as memory and perception, although, currently, empirical measurement can only be performed using subjective self-report scales. In regards to PK effects, parallels can be drawn between transliminality and labile capabilities within individual differences, including neurological and cognitive processes. Previous research has identified correlations between high scoring within transliminality and creativity scales, which are tempered by the participants' subjective history and past experiences.

The possibility that transliminality corresponds to neurological lability has also been explored with studies employing EEG imaging, observing distinct activation within the

temporal lobes. These findings further support theories that temporal lobe disorders and psi phenomena may be strongly associated.

In essence, for an acceptable working model of lability there are certainly a number of characteristics that can be borrowed from the concept of transliminality, which include the regular and possibly consistent flow between conscious and unconscious states; the potential for variation in magnitude and intensity; and the impact of exogenous stimuli. However, there are also divergent issues that can be addressed which are not compatible with the proposed lability construct. These issues involve the lack of empirical assessment involved with transliminality research, with studies primarily relying on subjective reports, rather than using psychometric measures. Furthermore, it is only able to offer tentative theories regarding *how* psi occurrence, as opposed to studies focusing on the perception and interpretation of *why*. Therefore, it may be appropriate to consider the concepts of transliminality and lability as being the same process, although, it is possible that lability is a moderating factor in regards to the effect on transliminality by exogenous factors.

Lability has been presented as a construct within individual systems and processes prone to innate randomness. However, both Stanford and Braud add a note of caution in agreeing that to measure lability within a process should not be confused with measuring the overall intrinsic activity within that process (Stanford, 1980). In the presented thesis, the ease of change associated with lability concentrates on the individual differences of creativity, emotions, personality and cognition. Therefore, the following chapter begins this exploration of individual lability by developing a new psychometric measure, the Lability Scale. Analysis of such a measure identifies a range of dimensions within the lability process warranting further research and enable further investigation of the relationship between lability interactions and PK experiences.

CHAPTER FOUR

DEVELOPMENT OF THE LABILITY SCALE AND EXPLORATION OF THE RELATIONSHIP BETWEEN LABILITY, PARANORMAL BELIEFS AND PSYCHOKINETIC EXPERIENCES

A SURVEY BASED STUDY

4. Introduction

The present chapter outlines the development of the Lability Scale (LS), a new self-reporting psychometric measure with which to explore individual lability. The previous chapter has offered a review of theoretical models and empirical research studies which have explored individual lability in relation to its role in the production of psi phenomena. However, these previous studies have employed a variety of means to determine individual lability. These have ranged from identifying lability with a specific existing trait, such as Openness to Experience or using a battery of established measures (Roe & Holt, 2006). Therefore, in order to explore individual lability with more efficacy within the current research there was an imperative to devise a scale solely devoted to individual lability and ascertain its components via factor analysis.

To this end, the Lability Scale (LS) was derived from items within established individual measures used within previous parapsychological research. Thus, the five measures included covered aspects of creativity – both cognitive and emotional – temporal lobe activity, mood and the personality trait of openness to experience. All such measures relate to variables which have the capabilities to fluctuate and so are seen as being on a spectrum, rather than as a fixed point. At this time, the development of the Lability Scale must be regarded as preliminary and the factor structure is therefore subject to change and refinement with subsequent usage within the following experimental studies. The initial Lability Scale consists of 71 items, 4 of which are reversed scored. The majority of the Lability Scale employs a 5-point Likert Scale, but does include smaller sections using both a dichotomous scoring ('Yes' and 'No') and a 3-point Likert Scale. The chapter also provides details of the psychometric assessment of the initial Lability Scale, including reliability of the identified factor structure and an assessment of potential construct validity demonstrated by evidence of both convergent and discriminant validity. As the Lability Scale is intended to take into

account the capabilities of an assortment of psychological and physiological individual differences, it is necessary to insure that it corresponds or have convergence to various established measures dedicated to specific aspects. However, it is necessary to continue further usage of the Lability Scale in future research in order to fully establish construct validity – that the Lability Scale does indeed measure individual lability.

The material contained in this chapter proceeds directly from Chapters Two and Three which offered a background of PK research and an explanation of lability by examining the definitions and characteristics within both psychological and physiological domains respectively. We have seen that previous research has explored individual aspects of creativity, openness to experience, neurological activity and state or current moods either theoretically or experimentally as being conducive to PK effects with encouraging results. Based on the review of this literature it would be remiss not to follow these promising leads and include specific measures of creativity, openness to experience, neurological activity and mood within the survey in order for the results to analysed psychometrically in order to identify any shared underlying lability factor.

Understandably, the complimentary question must be asked of how then lability should be measured, as at the present time, no singular tool has yet been established to satisfactorily address this issue, and how does it relate to parapsychological phenomena? Therefore, it is the purpose of this current chapter to outline the rationale and development of an acceptable measure with which to gauge levels of individual lability by using a composite of existing psychometric measures suggested by the promising results of previous experimental research, representing aspects of personality, creativity, mood and temporal lobe activity (Martin, Drennan, & Roe, 2010). Thus, in this manner, it may even be possible to classify an individual as ‘labile’ if correspondingly high levels of lability within individual differences are identified. Building on the premise that inherent lability within individual differences may have a contributing or predictive relationship with parapsychological phenomena. Furthermore, it is hoped that by assessing lability and possible mediating aspects, it will aid in the understanding of the posited relationship with paranormal beliefs and the perception of paranormal experiences.

By assessing the construct of lability via existing measures it is hoped that relevant aspects are identified from specific items with which to gauge individual lability. Measures were selected using literature reviews of related research within parapsychology and other

psychological domains, including abnormal psychology, cognitive neuroscience and personality studies as presented in Chapter Three.

In summary, in order to attempt classification of an individual as being ‘labile’ it would be necessary to explore the levels of lability observed within various individual difference aspects. The emphasis is placed on differentiating levels of individual lability, from low to high. It may be that there are other variables that ought to be considered as having relevancy to lability which have not been explored within this research, such as physiological processes. However, in order to provide a conceptual understanding of the research, it is necessary to first offer theories regarding the development and perpetuation of paranormal and PK experiences.

4.1. What is the paranormal?

At the present time, definitions of what constitutes paranormal phenomena have expanded since parapsychology has been accepted as a psychological discipline. For the majority of the general public, especially within the West, the paranormal encompasses such anomalous occurrences as ghosts; psychokinesis (PK); extra sensory perception (ESP); telepathy and precognition (Thalbourne & Rosenbaum, 1986). However, the literal translation of ‘paranormal’ from the Latin ‘beyond normal’ creates a suitable umbrella term for any field or event that cannot otherwise be comfortably classified within another scientific category (Irwin, 1999; 2009). Furthermore, the labelling of an event as paranormal has distinct socio-cultural partiality – what is considered overtly paranormal in one culture may have completely normative connotations in another. Within parapsychology there is ongoing debate as to whether the development and maintenance of paranormal beliefs are reliant on an individual experiencing a paranormal occurrence or vice versa (Thalbourne, 2004). Therefore, the following sections introduce background research relating to how we attempt to measure and understand paranormal beliefs, plus, the potential associations with experiencing anomalous events. It then proceeds to the methodology involved with the construction of questionnaire exploring lability and the relationships between paranormal belief and PK experiences.

4.2. How to Measure Paranormal Beliefs?

Within parapsychology in order to gain empirical data from subjective information it has been necessary to develop self-report scales. This also holds true for measuring paranormal beliefs. Within the last few decades the diversity of so-called paranormal beliefs

has led to delineating specific classifications, including Traditional Paranormal Beliefs (TPB); New Age Philosophy; practice of beliefs; psi phenomena; and existence of alien life. Such additions have required modifications to existing scales in order to retain both reliability and validity and also to develop new measures creating a gamut of choice for research purposes. However, Goulding and Parker (2001) state that the most popularly preferred measures over the last two decades have been the Revised Paranormal Belief Scale (Tobacyk, 2004); and the Australian Sheep-Goat Scale (Thalbourne & Delin, 1993). In addition, the Anomalous Experiences Inventory (Gallagher, Kumar, & Pekala, 1994) has proved popular as it is divided into relevant sub-scales for selective usage. These five subscales are Anomalous/Paranormal Experience (29 items); Anomalous/Paranormal Beliefs (12 items); Anomalous/Paranormal Fear (6 items); Drug Use (2 items); Anomalous/Paranormal Abilities (16 items).

4.2.1. Are there relationships between paranormal beliefs and psi effects?

Although researchers agree that belief in paranormal phenomena is multi-dimensional (Tobacyk & Milford, 1983; Irwin, 1985), parapsychological research has tended to focus more on the prevalence of types of paranormal belief and the relationship these have with psi effects. Whether these psi effects have been produced via the participants or the researchers themselves has been of particular interest (Schlitz, Wiseman, Watt, & Radin, 2006) and including exploring correlates between personality variables (Alcock, 1981). However, according to the review of empirical parapsychological literature by Irwin (1993), the formation and attenuation of paranormal beliefs only received cursory attention until recent years, regardless of the consistent popularity with the general population and steadily increasing interest within the entertainment industry. This begs the question as to whether high levels of paranormal belief are due to a lack of knowledge in scientific areas.

4.2.2. Belief and disbelief

In addition, Clarke (1991a; 1991b; 1995), has conducted studies on the potential mediating influences on both belief and disbelief. In order to explore the issue of paranormal belief as a whole it is essential that the study of 'non-believing' or sceptical opinions are also considered within research. The former study explored levels of paranormal beliefs in a sample size of over 1000 psychology students, finding distinct gender differences, with females expressing higher levels of belief in specific paranormal aspects, including ESP, life after death and astrology. Conversely, males had stronger beliefs in UFOs. Subsequent factor analyses revealed three separate factors labelled Psi-related Belief; Traditional Religious

Belief and Extraordinary Life Forms accounting for approximately 55% of the variance. The latter study also exploring psychology student attitudes and their levels of paranormal belief, found that reasons given by participants on lack of belief suggests similar factors as to the development and maintenance of beliefs – personal experience, influencing individuals and exposure to relevant literature. This study is interesting in the preference of beliefs for males and females, with females concerned more with aspects relating to the self and males concerned with exogenous phenomena. However, in both respects, the anomalous events considered both share common elements of hope and meaning to the individual. In this respect, individual views on paranormal belief may share a related goal to personal spirituality or religiosity.

4.3. Scepticism

What also must be noted, is not only the generation of paranormal beliefs, but so too of disbelief. Often, scepticism as a variable has been discounted, only to be considered when compared to proponent versus scepticism research or the differences between ‘sheep’ and ‘goats’ (Schmeidler & McConnell, 1958). However, within recent years, attention has turned to the formation of scepticism as an alternative area of research akin to the development of paranormal beliefs. Studies conducted by Lamont and colleagues (2007; Lamont, Coelho, & Mckinlay, 2009), have employed qualitative methodology to explore the reasons proffered by individuals of their disbelief in the paranormal, since vehement avowals of scepticism are generally not considered to need any form of justification, as opposed to parallel confessions regarding paranormal belief which are viewed as problematic and worthy of study. It was observed through the use of discourse and thematic analyses that similar themes emerged in the development of disbelief as with belief about the paranormal, especially in regards to socio-cultural influences and specific events within an individual’s history that had the power to alter their prior belief system. The imbalance within the amount of research into the two separate stances is of interest in regards to the findings of surveys focusing on paranormal phenomena, which generally focus on the evidence of belief rather than disbelief, although such data is still inherent.

In this same vein, previous research by Snel et al. (Snel, van der Sijde, & Wiegant, 1995) assessed the cognitive styles of field-dependency and reflexivity-impulsivity on 158 individuals categorised as either believers or disbelievers using the Dutch translation of the Sheep-Goat Questionnaire (Lay & Mischo, 1985). It was observed that the need for structure and context within field-dependency was more apparent within believers than disbelievers,

suggesting that believers are less likely to separate important and unimportant information. However, there was no observed difference between either sheep or goats in regards to impulsivity and reflexivity. As belief in the paranormal is a state that is subject to modification and is influenced by other variables, it perhaps should not be considered within research as a particularly stable personality characteristic.

4.4. What are Paranormal Experiences?

For an experience to be classified as paranormal relies heavily on the experient's own personal interpretation, causing an acknowledged difficulty common to the majority of research based on anecdotal and subjective accounts reported by individuals after an event has occurred. Schouten (1979a), whilst analysing the vast amount of data from original surveys collated by the SPR, Rhine Institute and the Sannwald collection, lamented that a major difficulty in de-coding observational reports is the lack of detail in the description of an event. Even when attempting macro-PK manifestation or ESP within an experimental environment, and with the advanced technology of the modern world, findings still have aspects of bias from eye-witness testimony, as well as any contextual and environmental mediators.

For an individual to indicate belief in paranormal phenomena is not indicative of also being an experient as it is generally assumed that experience of paranormal phenomena (and moreover of certain types), is rare. With an ongoing debate as to the value of accounts of spontaneous cases (Watt, 1990), the sheer volume of the general population who acknowledge having beliefs about the paranormal challenges the lack of empirical evidence that is commonly required to satisfy the guardians of science. However, it is advisable to take into consideration Batcheldor's (1984) group sitter techniques where the onus was on cultivating a belief in the eventual production of PK effects and the dissipation of inhibition which had consistently successful outcomes.

This section explore the research surrounding the experience of paranormal events, from the attempts to categorize types of occurrences and their prevalence to the different techniques of how they are studied.

4.5. How Can We Measure Paranormal Experiences?

Since the foundational survey work of Sidgwick et al. and the Society of Psychical Research initiating the 'Census of Hallucinations' (1894), the use of questionnaire-based surveys has been used almost exclusively in accruing information regarding subjective reports of paranormal experiences for academic purposes. However, as noted by Houran (2000),

parapsychological research can only rely on the analyses of the subjective reports of paranormal experiences and not of the actual experiences. Houran (2000) observes that the perception of an event as being paranormal relies on both physical and psychological factors, including expectation determined by individual beliefs and socio-cultural norms and contextual mediation. Wiseman and Smith (2002) conducted an investigation into possible motivational and cognitive biases that individuals may exhibit when exposed to an apparently paranormal event. It was posited that the misinterpreting of an event as 'paranormal' resulted from a need to confirm personal belief systems, with findings from experiments firstly rating a horoscope and secondly participating in an ESP task found significant associations between both believers and disbelievers assessing stimuli consistent to their own acknowledged beliefs, stemming from mainly cognitive biases.

Following a survey conducted on behalf of the Society for Psychical Research (SPR) Centenary census aggregating data gained from a sample of approximately 400 SPR members, Thalbourne (1994) was able to conclude that the typical respondent not only acknowledged belief about the paranormal, but also of being an experient of various forms of phenomena (although rarely of PK events), and tended to score highly as 'sheep' on the Australian Sheep-Goat Scale (Thalbourne & Delin, 1993). It was observed that data gained from such a relatively exclusive sample with an acknowledged interest in parapsychology would be interesting when compared against the general population. A similar survey study using data gained from an atypical sample of members of the Association of Research and Enlightenment (ARE) was conducted by Kohr (1980) in the United States, who also found corresponding high percentages of types of personal paranormal experiences and frequency when compared to earlier data using the same instruments compiled from a general population sample (Palmer, 1979) – a rare instance of replication within parapsychological research. Both these studies noted no significant influence from basic demographic variables of age, gender, socio-economic status, although there was a correlation between younger people experiencing déjà vu.

In keeping with this theme, Gaynard (1992), explored the attitudes of teenagers towards the paranormal using a questionnaire-based survey, finding that approximately 54% of the respondents stated that they had personal experience of a paranormal occurrence, with 42% claiming experience of two or more forms of phenomena, with instances of déjà vu, precognition and ghosts being the most prevalent and poltergeist activity and apparitions of living persons being relatively uncommon, lending support to the above findings by Kohr

(1980), although the frequency of such experiences in this instance were only reported in vague terms.

It may be that there are direct associations between types of experiences, suggesting that some phenomena may be more likely to occur to or be perceived by certain individuals, possibly suggesting that there may be an inherent psi sensitivity trait. Jawer (2006) lends to support to this theory by arguing that innate, inherited individual sensitivity may be a contributing factor in experiencing entity encounters. By using a survey method, he explored the relationship between chronic sensitivity conditions (including fibromyalgia and migraines), and paranormal experiences of 112 respondents and found that almost 74% stated that they had experienced an event that was perceived as unusual including electromagnetic influence. Jawer identified eight statistically significant demographic aspects to support an individual as being 'hypersensitive'; to which psi may have been a contributing factor: being female, first born/only child; being single; ambidextrous (dual handedness); perception as being imaginative; perception of being introverted; aware of a traumatic childhood event; awareness of having an effect on electromagnetic equipment. The apparent gender bias towards female 'sensitives' is offered as being neurobiological in nature and naturally occurring across all modalities. Jawer concludes that further related studies should also consider boundary thinness, and synaesthesia (multimodal sensory experiences) as being possible contributing factors to perceived paranormal experiences.

4.5.1. Measuring PK experiences

Previously, Louisa Rhine (1986) noted that gaining information on spontaneous real-world PK experiences has relied on analysing anecdotal reports or personal experiences, either collected via specific investigations, surveys or from official documents. As such, meta-analysis has been used to gain an overall perspective on the types of PK experiences and identify shared elements, such as gender, age groups, familial relationships and environments which have provided a basis for theories and empirical hypotheses. However, within the last few decades, researchers have developed a series of psychometric self-report measures exploring psi phenomena which are more suitable for empirical studies.

What is noteworthy within the scales developed for testing parapsychological experiences, such as the Australian Sheep-Goat Scale (1993); the Anomalous Experience Inventory (AEI) (Gallagher, Kumar, & Pekala, 1994); the Revised Paranormal Belief Scale (RPBS) (Tobacyk, 2004), is the minimal amount of items dedicated to specific PK experiences. For instance, there are only three items referencing PK effects specifically on the

AEI (Gallagher, Kumar, & Pekala, 1994), which cover objects disappearing, being able to influence an event by concentrating on it and being able to move objects at will. The broad nature of these items make it highly unlikely that that a respondent will answer affirmatively. Although, individuals may have willed on a horse in a race or blown on a pair of dice before throwing them and congratulated themselves if successful, these and similar everyday behaviour could be categorised as PK effects. However, if researchers assume that PK exists then it requires that we also need to measure types, experiences and effects more comprehensively than with a few items on a general scale. To this end, researchers have recently developed a scale dedicated to PK experiences and effects – the Rhine Psychokinesis Questionnaire (RPQ) (Simmonds-Moore, Rhine Feather, & Gadd, 2010). This new 38 item scale (see section 4.8.4 for details) explores specific aspects of PK experiences highlighted in the material gained over the years from reports of spontaneous occurrences. Therefore, issues such as electrical items or wristwatches malfunctioning; family members also experiencing PK effects (and the potential for heritability); influencing the weather; experiencing PK effects concurrent with extreme emotions; objects moving as well as the individuals own beliefs on whether or not they are the impetus for such events. That such a scale has been developed relatively late in PK investigations is surprising, but the timing is fortuitous in relation to the research proposed in this thesis.¹

4.5.2. Criticisms of self-report measures

In relation to the methodological practice of applying self-report scales, Roig et al. (1998) advise caution. The completion of scales with similar attributes for a self-report questionnaire may lead to context effects – whereby the scoring of a scale immediately one after another will necessarily be adjusted according to the respondents' perception of the relationship between the scales. Therefore, there is a risk in presenting a battery of measures in order to determine a new dimension – the resulting data may not reflect the shared elements aimed for, but rather that of the participants' awareness of how they think they should be competing the scales. Such methodological concerns over potential acquiescence in scoring may lead to questioning the validity of both significant and non-significant correlations of paranormal beliefs and personality variables explored within the previous research, including schizotypy (Thalbourne, Dunbar, & Delin, 1995), fantasy proneness (Irwin, 1990) and dissociation (Irwin, 1994), and irrational thinking (Tobacyk & Milford, 1983). However, there

¹ Following its use in the survey the researcher was able to forward data from the RPQ to the authors in order to assist with their confirmatory analyses

is also an argument that the summation of similar scales may actually enhance the integrity of scoring in relation to building a statistical model, as the individual becomes comfortable and more at ease with the perceived subject matter. Therefore, enhancing the possibility of identifying shared elements. The overall population regression effect could actually be underestimated (Shevlin, Miles, & Bunty, 1997).

4.5.3. Causes and effects of paranormal experiences

A survey study by Milton (1992), using a sample of twenty-two SPR members followed a conceptually different avenue of research by determining subjective theories of cause and effect of personal paranormal experiences, rather than the actual experiences. This involved exploring experient attitudes and feelings at the time of the experience; subsequent availability of social and professional support; perceived long-term effects; and potential of being involved in other occurrences. Although it was stated within the study that the types of experiences reported were relatively small in number (six separate themes emerged of known and unknown discarnate entity; precognition; ESP, OBE; miscellaneous), the impact of having an experience was observed to be incredibly powerful. There were clear indications that individuals dually attempted to explain situations both logically (especially with hindsight), but also acknowledged a spectrum of intense emotional reactions at the time of the occurrence – ranging from running out of a house screaming with fear, to feeling sheer joy and elation. In addition, the general theme observed that experients used caution in sharing details, even with close friends and family, due to the fear of derision or previously known sceptical beliefs or used humour in the recounting in an attempt to decrease the significance they may have felt. Unfortunately, there were too few responses to questions regarding support from formal organisations to make any conclusions, although answers to what sort of support would have been deemed useful observed that individuals would have preferred talking about their experiences, rather than being sent any ‘practical’ written information. The effect on experients’ lifestyles also covered broad responses, ranging from indifference to a complete ‘event horizon’ alteration to their beliefs and behaviours. A particularly noticeable theme was the sense of excitement that many experients found following an experience.

Wooffitt and Allistone (2005) further propose that a more qualitative approach to these experiences should be considered as important. The study of anomalous phenomena and related psychological aspects is now offered within mainstream education in the UK. This acceptance into mainstream culture is reflected in the phenomenology of how paranormal experiences are considered as part of normality, both from a Western and non-Western

perspective. In addition, the language used by individuals to communicate such experiences, by description and explanation, is also an inherent reflection on cultural views which would benefit from a more discursive mien in order to gain a richer understanding.

The findings from the given research above, show that there are areas of agreement within the tendency of individuals to report bimodal experiences – of either having a few or many – and of different types. Furthermore, there is a general lack of significant statistical evidence regarding the influence of demographic variables on experiences, as opposed to the apparent relationships between such and paranormal beliefs.

4.6. Associations Between Mental Health Disorders and Paranormal Experiences

Connections have been made between cognitive aberrations such as delusions and sensory hallucinations exhibited in neurological disorders and the perception of paranormal phenomena. Accounts of haunting manifestations commonly have an associated sense of presence, which also symptomatic of schizophrenia and epileptic disorders (Hergovich, Schott, & Arendasy, 2008). Within Western culture, a confession of experiencing an anomalous occurrence is quick to be regarded primarily as evidence of a possible mental health disorder. This prevalent attitude is further presumed to act as an inhibitor of potential first-hand reports. However, although cognitive deficits have the ability to alter subjective perception, the symptomology tends to only involve the individual as the sole experient - they are more likely to believe that they possess paranormal abilities which cause related occurrences (Beyerstein, 1996).

4.6.1. Psychics and Mediums: Exploring 'gifted' characteristics

With the prevalence of individuals employed professionally as clairvoyants and psychics who endorse their own paranormal abilities, it cannot be necessarily be presumed that declaration of perceived abilities therefore equates to instability in mental health. A review by Schmeidler (1974) of investigations with professional psychics found strong associations between individuals in the personality variables of extraversion, imagination and sensitivity to external stimuli.

Many of the measures used to assess paranormal belief specifically include items pertaining to an individual's own belief in whether they are psychic, including the Australian Sheep-Goat Scale (Thalbourne & Delin, 1993). Thalbourne (1999) conducted a study exploring responses to this specific scale item in a sample of 301 university psychology

students and found that those that answered affirmatively to believing they were psychic also scored higher overall on other items with significant correlations between such belief and transliminality ($r = .62$); creativity ($r = .36$) and schizotypal personality ($r = .36$). However, Thalbourne advises caution in pigeonholing individuals who believe they are psychic with specific characteristics on the basis of a single study, as there is a need to clarify whether individuals are experiencing sensory disturbances symptomatic of certain cognitive disorders such as epilepsy, which are then perceived as being anomalous, based on their own belief systems.

4.6.2. Psi effects and the body

There is a strong case in suggesting that psi effects are connected to physiological processes including activity within the central nervous system (CNS) which itself is governed by neurological mechanisms. In following this line of enquiry, with the temporal lobes managing multi-modal sensory input and perceptive processes, Persinger (1992; 1993), has offered the theory that perception of paranormal phenomena may be generated by sensitivity within the temporal lobes both in persons with diagnosed disorders and the general population, supporting theories by de A. Montagno and Roll (1982; 1983), that state that instances of RSPK closely resemble symptomatic seizures of psychomotor epilepsy (PME) which sensory disturbances and heightened memory capabilities. However it is open to debate as to whether this area of the brain is able to perceive paranormal experiences or is the actual generator of such events. In addressing this question Neppe (1983; 1983a) suggests that experiencing hallucinatory and déjà vu events associated with anomalous phenomena may be genetic and be passed through the familial line, in the same vein as psi and 'second sight' abilities.

4.6.3. Mass Witnesses to Paranormal Experiences

In addition, throughout history there have been reports of mass witnesses to paranormal experiences, as illustrated in religious visions such as of the Virgin Mary. Studies investigating the onset of mass hysterical episodes such as those recorded in Korea, have observed that such contagion is often stimulated by dominant personalities that subsequently influence (albeit unconsciously), subordinate individuals to mimic a similar state. It is possible that a similar viral concept occurs with accounts of paranormal events simultaneously witnessed by many individuals.

Many instances of mass witness events involve more females than males and a possible fear of the paranormal may be a mitigating factor in the perception of ambiguous stimuli or situations being misinterpreted. A study conducted by Houran and Lange (1997b), investigating haunting and RSPK activity. Using the 'Fear of the Paranormal' subscale within the Anomalous Experiences Inventory (Gallagher, Kumar, & Pekala, 1994), it was hypothesised that females from a sample of 49 adults would score more highly, which results found to be supported ($F(1, 47) = 4.35, p < .05$), although there was no gender difference in tolerance to ambiguity. However, with many mass witness events having religious impact, it may be that they are therefore associated with less negative connotations.

4.7. Summary

This section has provided an overview of the salient limitations that researchers have investigating paranormal experiences, whether within the field or attempting studies within a controlled environment. Commonly, information is retrieved using questionnaire-based surveys, which produce empirical evidence on the types and frequency of experiences and over the years various psychometric instruments have been developed which incorporate a diversity of paranormal categories. Furthermore, it has been observed that out of all the credited paranormal experiences, manifestations of PK phenomena are not only rare, (although existence is widely acknowledged), but have very few dedicated items within any of the established measures. It is with this research background in mind that the following sections present the development and design of the questionnaire-based study investigating the relationship between lability and paranormal beliefs and experiences, which includes the construction of a new measure with which to assess lability.

4.8. The Survey

4.8.1. Design

This was a survey-based online study using a battery of five individual difference measures with which to assess the construct of individual lability: The Emotional Creativity Inventory (ECI) (Averill, 1999); The Creative Cognition Inventory (CCI) (Holt, 2007) Goldberg's Openness to Experience Scale (Goldberg, 1999); The Complex Partial Epileptic-like Signs Scale (CPES) of the Personal Philosophy Inventory (PPI) (Persinger & Makarec, 1987); Mood Lability (MOOD) (Akiskal, et al., 1995). Scores from the measures were collated and factor analysis conducted to explore the multifactorial nature of individual lability. Additional correlational analyses compared the scores from identified subscales with the scores from two

parapsychological measures – the Anomalous Experience Inventory (AEI) (Gallagher, Kumar, & Pekala, 1994) and the Rhine Psychokinesis Questionnaire (RPQ) (Simmonds-Moore, Rhine Feather, & Gadd, 2010). Differences between the genders were explored for the developed Liability Scale, the identified factors, anomalous experiences and psychokinetic experiences. Scores for all the variable measures were interval level apart from gender.

4.8.2. Aims

- 1) The primary aim of the survey was to construct a psychometric instrument with which to measure the newly developed construct liability.
- 2) A second aim was to explore the contributing factors within liability and the relationships with these factors to the parapsychological measures of anomalous experiences and psychokinetic experiences
- 3) A third aim was to assess the differences between the genders in relation to individual liability scores, anomalous experiences and psychokinetic experiences

4.8.3. Method

4.8.4. Participants

The only designated restriction given was that the respondents be adults (over the age of 16 years). Links to the survey site were included in social media sites and forwarded to organizations, in an attempt to accrue a varied international sample of both males and females and sceptical and proponents. It was initially hoped to achieve a sample size of 500 respondents, but by the time of the final analyses 213 surveys had been completed. From this original sample 21 cases were excluded due to missing data and a total of 192 cases were eventually deemed suitable for analyses ($N = 192$). 118 respondents were female (61.5%) and 74 were male (38.5%). The age range was between 17 and 77 years with a mean age of 39.53 years ($SD = 13.85$). Kline (1999) recommends that in order to gain an adequate representation of the general population the sample size should be at least 500 and a good sample would be 10,000. Although, achieving such numbers was not possible within the time-line of the survey being active online, he further concurs that ‘an adequate normative size is no absolute matter’ (Kline, 1999, p. 51). The sample size was deemed adequate on Cohen’s recommendation of using < 28 participants to detect a large effect size ($r = .50$); > 85 participants to detect a medium effect size ($r = .30$); and 783 participants to detect a small effect size ($r = .10$) (1992).

4.8.5. Battery of measures to assess individual lability²

Creativity styles were explored by using:

The Emotional Creativity Inventory (ECI), (Averill, 1999). A 30-item scale using a 5-point Likert response scale (1 = Strongly Disagree to 5 = Strongly Agree), assessing identified aspects of emotional creativity: preparedness (7-items, $\alpha = .82$); novelty (14-items, $\alpha = .84$); effectiveness (5-items); and authenticity (4-items). When effectiveness and authenticity are combined into a total 9-item subscale produce ($\alpha = .83$). Although two items are scored reversely, this has been shown not to effect response bias. The overall reliability for the scale was strong ($\alpha = .90$, $N = 489$), and a test-retest reliability analysis within a three month interim shows a high degree of internal consistency, also ($r = .91$, $n = 45$), (Averill, 1999). Furthermore, it has been previously observed that creativity has a strong relationship with transliminality (Thalbourne & Delin, 1994), which may aid in understanding a new construct characterised by change.

The Creative Cognition Inventory (CCI), (Holt, 2007). A 29-item scale using a 5-point Likert response scale (1 = Not At All Important, 5 = Extremely Important), examining different cognitive styles employed by individuals within the creative processes. It includes seven identified subscales with relatively high internal consistency: heightened internal awareness (11-items, $\alpha = .91$); intuition and inspiration (4-items, $\alpha = .73$); linear (4-items, $\alpha = .74$); playful (3-items, $\alpha = .70$); analogous (3-items, $\alpha = .63$); oneiric/from dreams (3-items, $\alpha = .73$). It has also shown a high overall internal consistency ($\alpha = .90$).

Goldberg's Openness to Experience Scale (OE), (Goldberg, 1999). A 20-item measure using a 5-point Likert response scale (1 = Very Inaccurate, 5 = Very Accurate), which also has 10-items scored reversely. This scale has been derived from the international personality item pool (IPIP), (Goldberg, et al., 2006), which is a measure freely available for public usage and was developed to represent the Openness to Experience (OE) construct of the NEO personality inventory (Buchanan, Johnson, & Goldberg, 2005). Goldberg (1993) has categorised individuals with high levels of trait OE to be appreciative of the arts, impulsive, adventurous, possessing imagination and curious about their external and internal reality.

The Complex Partial Epileptic-like Signs Scale (CPES) of the Personal Philosophy Inventory (PPI), (Persinger & Makarec, 1987). A 16-item subscale which explores temporal lobe sensitivity and employs a dichotomous (No/Yes) response set. It has test-retest

² See Appendix A.1 for copies of the battery of measures used within the survey

correlations of .85 to .95 (10 days) and .60 to .70 (100 days). The subscale relates complex partial epileptic signs including anomalies within perception, sensory and bodily information, cognition and dissociation. Makarec & Persinger (1985) state that although within the spectrum of a clinical sample such temporal lobe lability is symptomatic of actual complex partial epileptic seizures, such aspects are also strongly associated with hypomania within individuals considered to be 'normal', highly creative, and further, with the cultivation of 'exotic beliefs' (Persinger & Makarec, 1990). In addition, the scale is considered to reflect elements of boundary thinness and may be useful in assessing 'anomaly-prone' personality types (Simmonds-Moore, 2008). It has been noted by Persinger during development of the scale and a related study (1988), that neurological lability within the temporal lobes may be affected by other bodily states, such as tiredness, malnutrition and stress responses and that there is a positive relationship between temporal lobe activity and paranormal experiences. These studies support earlier research by Neppe (1983a) which has explored the relationship between Subjective Paranormal Experiences (SPE) and sensory disturbances stemming from temporal lobe activity via Neppe's Temporal Lobe Questionnaire, which includes instances of déjà vu (the perception that an event has been experienced previously) which are symptomatic of epileptic disorders.

Mood Lability (MOOD), (Akiskal, et al., 1995), using 3-items which used a 3-point Likert response scale (1 = Not At All, 2 = undecided, 3 = Very Much So). Mood Lability had initially been identified within the cited study whilst exploring clinical bipolar II disorder subtypes. It was concluded by Akiskal et al. (1995), that such a subtype was typified by intrusive mood lability within depressive episodes, possibly leading to accentuation.

4.8.6. *Parapsychological measures*

The Anomalous Experiences Inventory (AEI), (Gallagher, Kumar, & Pekala, 1994). Although the complete measure comprises of 70-items, only three subscales (44-items), were deemed appropriate for this study – Anomalous/Paranormal Belief (12-items); Anomalous/Paranormal Experiences (29-items); and Anomalous/Paranormal Ability (16-items). The internal consistency is high with the Kuder Richardson-20 statistic ranging between .64 and .85. The measure uses a dichotomous (True/False) response system. The scale was deemed suitable as it not only enquires about aspects of psi but also more contemporary phenomena such as belief in aliens and non-traditional religious practices including witchcraft. Subsequent reliability analysis following inclusion in this survey showed a strong Cronbach's alpha ($\alpha = .91$).

**The Rhine Psychokinesis Questionnaire (RPQ)*, (Simmonds-Moore, Rhine Feather, & Gadd, 2010). 38-item measure using a 5-point Likert response scale (1 = Strongly Agree, 5 = Strongly Disagree). The scale has been developed to specifically explore psychokinetic events and experiences, a psi phenomenon that has been somewhat neglected in regards to item inclusion in existing parapsychological measures such as the Revised Paranormal Belief Scale (Tobacyk, 2004), The Australian Sheep-Goat Scale (Thalbourne & Delin, 1993), but which is of particular pertinence to the current study. Reliability analysis on the RPQ after use in this study showed a strong Cronbach's alpha ($\alpha = .88$).

*(Note: As a newly constructed measure, the survey has not yet been the subject of a full psychometric assessment).

4.8.7. Procedure

As the research involved the contribution of human respondents it was necessary to conform to the strict guidelines proposed by the British Psychological Society and to gain formal approval from the institutional edicts of the University of Northampton Research Degree Board prior to data collection.

The initial questionnaire of 'Lability, creativity, personality and paranormal belief' was disseminated using the online survey website 'SurveyMonkey' link <http://www.surveymonkey.com/s/IndividualPK>. The decision to manage the survey using an online method was primarily due to the ease of disseminating the survey in an attempt to accrue a large and varied population sample. As the survey was of a relatively common type, comprised of a series of rated scales for anonymous participants to complete and did not ask any particularly sensitive questions, the risks posed using an internet tool are minimal (Barchard & Williams, 2008). Furthermore, as reviewed by Birnbaum (2004a), any ethical considerations regarding participation within internet-based psychological research are the same as within in-person research, including obtaining informed consent; the right to withdraw; avoidance of harm; confidentiality; deception and debriefing. In addition, in addressing possible inherent response differences from such online tools, Krantz and Dalal (2000) reviewed survey-based studies conducted online with those conducted in-person within a laboratory and concluded that findings were much in agreement with each other, with no noticeable biases in regards to responses from either in-person survey methods or online-based methods. Further supporting evidence for internet-based research is offered by Murray and Fisher (2002), who state that resulting data can yield a more representative participant sample and retain strong psychometric properties. However, a minor issue identified by

Birnbaum (2004a), is the greater number of dropout rate for online survey research compared to in-person research, theorised to be due to the lack of social pressure and embarrassment, which may have impacted on the current survey.

The format of the online survey tool allowed for an introduction to be placed on the initial survey page explaining the nature of the survey. Respondents were informed that the survey would be investigating aspects of individual personality, creativity and anomalous/paranormal experiences by using self-report measures.

Emphasis was placed on confidentiality and the option to cease completing the survey at any juncture if they so wished, with none of their inputted data being retained or used further. In addition the actual survey tool would not record any personal details such as email or ip address from which the respondent could be traced. Contact details for the primary investigator were placed at the end of the introduction in regards to any potential queries.

The measures used were formatted on the website in the following order following completion of basic demographic details of gender and age: Creative Cognition Inventory (Holt, 2007); The Emotional Creativity Inventory (Averill, 1999); Mood Lability (Akiskal, et al., 1995); Goldberg's Openness to Experience Scale (Goldberg, 1999); The Complex Partial Epileptic-Like Signs Scale of the Experiences of Personal Philosophy Inventory (Persinger & Makarec, 1987); The Anomalous Experiences Inventory (Gallagher, Kumar, & Pekala, 1994); The Rhine Psychokinesis Questionnaire (Simmonds-Moore, Rhine Feather, & Gadd, 2010).

The respondents raw data was downloaded directly to the primary investigator's hard drive, which was then stored securely using password protection to access files.

As the study was conducted using an online service, respondents were able to complete the survey at their own discretion and within their own time. The ethical considerations of the right to withdraw at any time and informed consent were offered at the onset and the reassurance that all details would remain confidential. The survey presented an initial participant information form outlining the nature of the survey and offered the contact details of the primary investigator and included 2 questions relating to age and gender of the respondents. The survey ended by thanking the participants for their involvement. The order of the measures was as follows, beginning with the five individual difference measures (with the longer of the measures to be completed at the onset), followed by the two parapsychological measures: The Creative Cognition Inventory (Holt, 2007); The Emotional Creativity Inventory (Averill, 1999); Mood (Akiskal, et al., 1995); Goldberg's Openness to Experience Scale (Goldberg, 1999); The Personal Philosophy Inventory (Persinger &

Makarec, 1987); The Anomalous Experiences Inventory (Gallagher, Kumar, & Pekala, 1994); The Rhine Psychokinesis Questionnaire (Simmonds-Moore, Rhine Feather, & Gadd, 2010).

The online survey service automatically collected basic response data which was then able to be downloaded and the format transformed for full psychological statistical analyses.

	Very inaccurate	Moderately inaccurate	Neither inaccurate or accurate	Moderately accurate	Very accurate
Am not interested in abstract ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Tend to vote for liberal political candidates	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Am not interested in theoretical discussions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Believe in the importance of art	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enjoy hearing new ideas	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Have a vivid imagination	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do not like art	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do not like poetry	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Enjoy wild flights of fantasy	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Do not enjoy going to art museums	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Can say things beautifully	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Figure 4.1. *Screenshot of the Openness to Experience section of the online survey on the SurveyMonkey website*

4.9. Results

As the analysis for this particular research is quantitative the role of normal distribution in relation to the raw data is briefly discussed. It is necessary within the use of statistical analysis to consider that the findings from any sample size employed within psychological research should ideally be transposed as a reliable indication of the general population. In order to do this, the method within the preliminary stages of quantitative analysis considers the normal distribution of results in the raw data to assess whether they met parametric assumptions. If an obvious skewness or kurtosis within the data was apparent, it would not be appropriate to employ subsequent parametric tests.

4.9.1. Descriptive Statistics

Distributions. In order to conduct parametric inferential statistical analyses, sample data must conform to certain assumptions regarding the normality, linearity and

homoscedasticity of the distribution (Field, 2009). A departure from normality within these spheres lessens the robustness of the statistical inference and therefore the confidence in the end results. Initial normality can be assessed by examining the skewness and kurtosis in the distribution of variables, by examining the raw data and observing the pattern graphically in a normal frequency distribution plot. A normal distribution occurs when skewness and kurtosis scores are at zero, indicating that the mean of scores is at the centre of a distribution and it has symmetry.

Skewness. Skewness shows whether the shape of the distribution is asymmetrical. In general, a skewness score more than twice the size of its standard error presents a significant departure from normality. Positive skewness can be observed graphically with a long tail towards the right of the plot, with negative skewness having a long tail to the left. These would indicate the scores from a sample departing from normality, with scores clustering either side of the centre.

Kurtosis. Kurtosis shows the degree observations cluster around the central tendency. In a perfect distribution, kurtosis scores should be zero. Positive kurtosis shows that a large number of scores cluster around this central point, creating a pointed or heavy-tailed distribution in the graphic plot. Negative kurtosis would show the distribution to be spread out away from the central tendency and observe a flattened graphic plot. In addition, the z -scores of skewness and kurtosis can be used to assess normality rather than the expected score of zero. Departure from normality occurs if the z -score ratio is less than -2.54 or more than +2.54. This section presents an overview of the variables departing from normality and the potential of transforming the data.

Tests of normality. Howell (2006) recommends the Kolmogorov-Smirnov (K-S) test to assess whether the sample distributions deviates from normality as a whole by comparing the given sample to normally distributed scores with the same mean and standard deviation. If significance is shown in the K-S the distribution within the research sample deviates considerable from the norm. Performing the K-S is of additional benefit alongside viewing the graphic data via histograms and plots. However, a large sample size amplifies any small deviations and present significance, (Field, 2009).

4.9.2. Considerations of power analysis

Quantitative research methods rely on collecting mean data from a sample population in order to test an experimental hypothesis based on independent and dependent variables. The

researcher either seeks to reject the null hypothesis (that there will be no effect shown) or accept the alternative hypothesis (that a predicted effect is shown). An effect is shown if the outcome achieves statistical significance based on the probability that it has occurred other than by chance. Within psychology, this significance criterion is commonly assessed using a probability value or p-value of $p < .05$ (the effect has likely to have occurred only by 5% by chance). This significance criterion is recommended in order to deflect the possibility of Type I error occurring - a false-positive result – whereby the null hypothesis is rejected when it is true. In addition, when in order to minimise a Type II error – a false negative result – whereby a null hypothesis is not rejected although it is false, the power effect should be greater than .80.

Power analysis within statistical analyses determines whether or not the found probability or p-value does reject the null hypothesis (Cohen, 1988) and is dependent on three aspects: the p-value; the magnitude of the effect; and the size of the sample used. It is recommended that power analysis is gained prior to a study being conducted in order to assess whether the intended sample is of adequate size to show an effect accurately.

Quantitative researchers such as Cohen (1988) and Kline (1999) advocate the necessity of considering and providing the appropriate power analyses for statistical findings throughout psychology fields. However, Kennedy (2003) has argued that perhaps a different emphasis on power needs to be considered for psi-specific studies. In this instance, the subject matter being tested, PK, is known not to be stable or offer consistent results and may also be highly dependent on individual differences, including potential experimenter effects. Therefore, Kennedy (2003) states that theoretically, in relation to gauging the power of an effect, it should not matter whether the population is small or large, rather, it should concern the individual. To support these claims, Kennedy offers findings from a meta-analysis of PK-RNG studies which have not shown that the expected association between the sample size and significance criterion (Radin & Nelson, 2000). Further meta-analyses have shown that PK studies have shown an inverted association between effects size and sample size (Steinkamp, Boller, & Bosch, 2002). Yet, more recently, Kennedy (2004) has acknowledged that in order to develop a standardised experimental methodology with which to test for psi effects and satisfy the perspectives of both proponent and sceptical enquirers, the inclusion of power analyses should still be mandatory as it has been given little attention in previous parapsychological research. Therefore, the inclusion and interpretation of power analyses is to be considered a prerequisite for the statistical analyses conducted within this research.

Primarily, individual variables were titled according to the measures used – PPI, ECI, CCI, OE, MOOD, AEI and RPQ. Data assumptions from the initial 213 completed responses were initially inspected informally for any obviously suspicious patterns that may unduly influence results, such as outliers and violation of homoscedasticity. Following regression analysis, a filter was performed excluding the observed individual case outliers (see Appendix A.2, Figure 1.10) and a total sample of 192 cases ($N = 192$), was included within the final analyses. As recommended by Field (2005), due to the large sample size it was considered more appropriate to actually look at the distribution of the scales used visually using histograms outlining the normal distribution curve (see Appendix A.2, Figures 1.1; 1.2; 1.3; 1.4; 1.5, 1.6, 1.9), rather than rely on the calculated significance of z -scores gained from the results of the descriptive statistics shown in Table 4.1.

Table 4.1.

Descriptive statistics of means, standard deviations, skewness, kurtosis and Kolmogorov-Smirnoff test for the self-report measures of the Creative Cognition Inventory (CCI), Emotional Creativity Inventory (ECI), Mood Affect (MOOD), Openness to Experience (OE), Personal Philosophy Inventory (PPI), Anomalous Experiences Inventory (AEI) and the Rhine Psychokinesis Questionnaire (RPQ)

<u>Variable</u>	<u>Mean</u> <u>(SD)</u>	<u>95% CI</u> <u>Lower</u>	<u>95% CI</u> <u>Upper</u>	<u>Skewness</u> <u>(SE)</u>	<u>Kurtosis</u> <u>(SE)</u>	<u>K-S</u> <u>(sig. p- value)</u>	<u>N</u>
CCI	102.94 (18.78)	100.26	105.61	-.50 (.18)	1.05 (.35)	.05 (.200)	192
ECI	103.67 (16.84)	101.17	105.97	-.80 (.18)	3.73 (.35)	.06 (.068)	192
MOOD	9.66 (5.22)	8.91	10.40	-.09 (.18)	-.82 (.35)	.07 (.026)	192
OE	65.13 (13.62)	62.19	67.0	-.28 (.18)	-.87 (.35)	.09 (.001)	192
PPI	21.42	20.88	21.96	.36	-.80	.12	192

	(3.80)			(.18)	(.35)	(.000)	
AEI	78.93	77.83	80.03	-1.14	1.04	.12	192
	(7.74)			(.18)	(.35)	(.000)	
RPQ	141.30	138.48	144.12	-.26	-.37	.08	192
	(19.80)			(.18)	(.35)	(.003)	

*Note: **bold** font indicates deviations from normality where data were converted to z-scores and significance calculated: $z\text{-score} = s - 0/SE$. The resulting value is significant if greater than 1.96 for $p < .05$.*

The significant negative skewed distributions shown in Table 4.1 for the ECI and AEI indicate a build-up of high scores on these scales. Such initial results are informative as it suggests that participants had initial high levels of aspects of emotional creativity and also levels of paranormal belief. The significant positive value on the PPI indicates that there were many low scores suggesting that participants had low levels of epileptic-like experiences. These preliminary results enable us to begin building a picture of how the data eventually impacts on identifying shared elements of individual lability.

4.9.3. Relationships Between the Survey Measures

Spearman's rho correlational analyses was performed to assess the relationships between the battery of five individual difference measures.

Table 4.2

Correlations between the battery of five individual difference measures of the Creative Cognition Inventory (CCI), Emotional Creativity Inventory (ECI), MOOD, Openness to Experience (OE) and Personal Philosophy Inventory (PPI).

<u>Variable</u>	<u>CCI</u>	<u>ECI</u>	<u>MOOD</u>	<u>OE</u>	<u>PPI</u>
CCI	—				
ECI	.64**	—			
MOOD	.15*	.20**	—		
OE	-.26**	-.24**	.12	—	
PPI	.68**	.57**	.31**	-.14	—

*Note: ** $p < .01$, * $p < .05$, 2-tailed, $N = 192$*

As shown in Table 4.2 there were significant strong positive relationships between CCI and ECI ($rs = .64, p < .01$), plus a small significant positive relationship between CCI and MOOD ($rs = .15, p < .05$). Further positive relationships were shown between the ECI and MOOD ($rs = .20, p < .01$) and the PPI ($rs = .57, p < .01$). These show that as levels of emotional

creativity increase, so to do levels of Mood and epileptic-like neurological activity. This positive relationship was also shown between PPI with MOOD ($rs = .31, p < .01$). However, there was a significant negative relationship found between OE and both CCI ($rs = -.26, p < .01$) and ECI ($rs = -.24, p < .01$) showing that as levels of cognitive creativity and emotional creativity increase, levels of openness to experience decrease.

In Table 4.3 when Spearman's rho correlations were conducted on the entirety of the separate measures variables, including the AEI and RPQ it was a highly significant positive correlation between the AEI and RPQ ($rs = .72, p < .01$). This highlights that individuals with high levels of anomalistic experiences and belief also had high levels of perceived psychokinetic experiences.

Table 4.3

Correlations between the individual difference measures of Personal Philosophy Inventory (PPI), Creative Cognition Inventory (CCI), Emotional Creativity Inventory (ECI), MOOD, Openness to Experience (OE) and the paranormal measures of the Anomalous Experience Inventory (AEI) and the Rhine Psychokinesis Questionnaire (RPQ)

<u>Variable</u>	<u>(PPI)</u>	<u>(CCI)</u>	<u>(ECI)</u>	<u>MOOD</u>	<u>(OE)</u>	<u>(AEI)</u>
AEI	-.70**	-.54**	-.51**	-.07	-.12	—
RPQ	-.61**	-.46**	-.45**	-.11	.04	.72**

Note: ** $p < .01$; * $p < .05$, 2-tailed, $N = 192$

Furthermore, as shown in Table 4.3 there are strong inverse correlations between temporal lobe lability as scored on the PPI and AEI ($rs = -.70, p < .01$), and RPQ ($rs = -.61, p < .01$). These show that as scores on the PPI increase, scores on the AEI and RPQ decrease. Inverse relationships are observed between AEI and CCI ($rs = -.54, p < .01$) and ECI ($rs = -.51, p < .01$). The relationship between RPQ and CCI ($rs = -.46, p < .01$) and ECI ($rs = -.45, p < .01$) showed similar inverse patterns, meaning that as levels of psychokinetic experiences increased levels of creativity for both the CCI and ECI decreased. There were no significant relationships between scores on OE and either AEI or RPQ. There were no significant relationships between the MOOD and either AEI or RPQ.

4.9.4. Reliability and Validity of the Liability Scale

In order to determine whether the construct liability was able to be measured appropriately using the developed questionnaire, it was deemed necessary to explore whether there were any underlying components (factors) within the measures. According to Kline (1999) such components are considered to be “real factors” in that they are explicitly derived from the initial data collected as opposed to common factors which are only estimated. Principle Component Analysis (PCA) condenses down the raw data into linear components or factors and identifies the contributing variables. PCA then reduces these variables into smaller components or factors in order to then assess the relationships between each. The PCA employed is exploratory, in that it describes and summarizes the data gained from the sample population rather than offer support to a theory that can be generalised (Kline, 1999). Tabachnick and Fidell (2001) state that in order to fulfil the criteria for PCA the sample must be of an adequate size, with $N = 100$, poor, $N = 200$, fair and $N = 300$ good. The resulting data from sample size for the survey numbered at 192 which is within the remits for PCA. Therefore, data consisting of 110-items was examined using exploratory Principle Component Analysis (PCA) with Kaiser Normalization. This process reduces the potentially correlating variables into components or factors which relatively independent from each other.

Initially the five individual measures were explored using correlations (see Table 4.2), where Pearson rho values (r) did not exceed .85 as recommended by John and Benet-Martinez (2000). The 110 items comprising of the five individual difference measures of CCI, ECI, PPI, Mood and OE were assessed using reliability analysis resulting in a very respectable overall Cronbach's alpha ($\alpha = .92$), with none of the individual items causing concern in raising the alpha if deleted.

4.9.5. Exploratory Principle Components Analysis

A principle components method was used to extract independent factors and an orthogonal rotation which enabled the identified factors to remain uncorrelated was conducted using varimax, so to minimize the tendency of a general factor (Gorsuch, 1983) and maximizing the spread of factor loadings (Tabachnick & Fidell, 2001).

The graphical representation of a scree plot (Figure 4.1) was employed to decide on the number of factors to be retained, as initially recommended by Cattell (1966) as rotating all items with an eigenvalue over one may lead to the number of significant factors being greatly exaggerated. Therefore, by eye-balling the scree-plot (Figure 4.2). to detect the distinct

levelling off cut-off point for important factors, it was decided that five factors be retained out of a total of twenty-nine with eigenvalues > 1 , (Kaiser, 1974), with the combined factors accounting for approximately 35% of the cumulative variance as shown in Table 4.3. However, this amount may be relatively low as advised by Kline (1994), whereby approximately 63% is a preferred target.

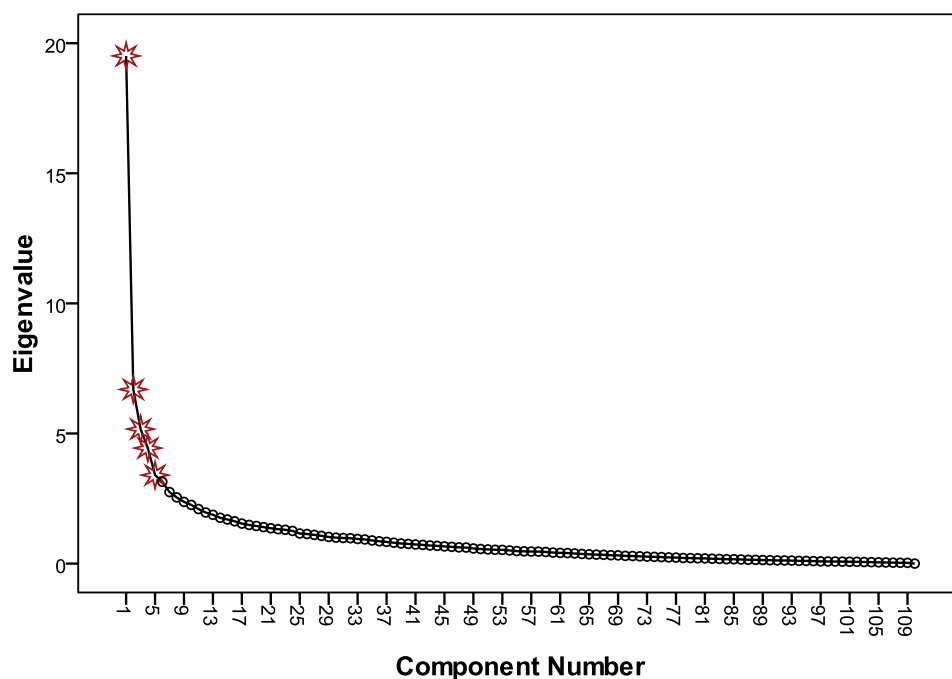


Figure 4.2. Scree plot identifying 5 components having eigenvalues over 1 to be retained

Table 4.4 *Table showing loadings on the five identified factors*

<u>Factors</u>	<u>Initial Eigenvalues</u>			<u>Rotation Sums of Squared Loadings</u>		
	<u>Total</u>	<u>% of Variance</u>	<u>Cumulative %</u>	<u>Total</u>	<u>% of Variance</u>	<u>Cumulative %</u>
Factor 1	19.51	17.74	18.74	12.19	11.09	11.09
Factor 2	6.69	6.08	23.82	7.68	6.98	18.06
Factor 3	5.17	4.70	28.52	7.23	6.59	24.65
Factor 4	4.44	4.04	32.56	7.25	6.59	31.24
Factor 5	3.40	3.09	35.65	4.86	4.42	35.65

As recommended by both Kline (1994) and Child (1990), factor loadings for each item above .30 as a sensible minimum were retained indicating that at least 9% of the variance is accounted for. Items were automatically organized into each factor depending upon the greatest factor loading, the individual item factor loading on the five retained factors are given in Table 4.4. Following the recommendations by Kline (1999) a total of 38 items were excluded, including 8 which did not load on the five retained factors; 25 items with loadings > .30 on more than one factor and a further 5 items which were shown to alter the initial alpha to above .83 if deleted.

4.10. The Liability Scale

Consequently, this left a remaining 71 items ($\alpha = .86$) within the scale, 5 of which are reversed ($M = 186.98$, $SD = 25.08$, $N = 192$). (A table of the rotated factor loadings can be found in Appendix A.7 and a copy of the Liability Scale can be found in Appendix A.8).

Histograms exploring the means, standard deviations, skewness and kurtosis for the Liability Scale and the five factors can be found in Appendix A.10 (Figures 1.11, 1.12, 1.13, 1.14, 1.15, 1.16).

Factor 1 Intuitive Cognition: accounted for 11.09% of the total rotated variance (rotated eigenvalue = 12.19), consisting of 26 items ($\alpha = .92$). It was defined as Intuitive Cognition with loadings primarily on items derived from the Creative Cognition Inventory (Holt, Creativity, states of consciousness and anomalous cognition: The role of epistemological flexibility in the creative process, 2007). Items with the highest loadings pertained to a sense of ‘other’ and transcendental mentation with further loadings on oneiric cognition. It could be possible to relate such a subscale to existing theoretical models regarding exercising both physical and mental liability and psi effects within certain transcendental practices used in Eastern Mysticism, such as meditation and forms of yoga (Braud, 2010). Furthermore, a few items also included within this factor were otherwise derived from the Personal Philosophy Inventory (Persinger & Makarec, 1987), which also has strong conceptual implications for the presumed relationship between meditative practices and temporal lobe activity (Persinger, 1993b).

Factor 2 Conceptual Cognition: explained 6.98% of the total rotated variance (rotated eigenvalue = 7.68), consisting of 23 items ($\alpha = .42$). It was defined as Conceptual Cognition with loadings primarily on items derived from Goldberg’s Openness to Experience Scale (Goldberg, et al., 2006) and 2 items taken from the Creative Cognition Inventory (Holt, 2007) concerned with conceptualisation and interest in creative pursuits.

Factor 3 Ego-Orientated Cognition: explained 6.59% of the total rotated variance (rotated eigenvalue = 7.23), consisting of 12 items ($\alpha = .78$). It was defined as Ego-Orientated Cognition and consisted of loadings primarily on items from the Emotional Creativity Inventory (Averill, 1999) concerned with the interpretation of subjective emotional experiences, with 2 further items from the Personal Philosophy Inventory (Persinger & Makarec, 1987) and Goldberg’s Openness to Experience scale (Goldberg, et al., 2006), relating to use of intuition and grasp of reality.

Factor 4 Emotional Interpretation: explained 6.59% of the total rotated variance (rotated eigenvalue = 7.25), with 10 items ($\alpha = .71$). It was defined as being Emotional Interpretation and consisted of loadings on items from the Emotional Creativity Inventory (Averill, 1999) pertaining to the understanding of emotional reactions.

Factor 5 Analytical Cognition: explained 4.42% of the total rotated variance (rotated eigenvalue = 4.86) and consisted of 5 items ($\alpha = .79$). It was defined as Analytical Cognition with loadings on items combined from the Creative Cognition Inventory (Holt, 2007) pertaining to rational thought with a further 2 items from the Personal Philosophy Inventory (Persinger & Makarec, 1987) pertaining to disorientation and oneiric sensations. This factor could correspond models regarding affective instability which is symptomatic of bipolar disorders (Larsen, Diener, & Emmons, 1986; MacKinnon & Pies, 2006).

4.10.1. Descriptive results for the five factors and the Lability Scale

Descriptive analyses was performed in order to explore assumptions of normality for the five factors of Intuitive Cognition, Creative Cognition, Ego-Orientated Cognition, Emotional Interpretation and Analytical Cognition and the Lability Scale. Results are shown in Table 4.6.

Table 4.6 *Descriptive statistics showing the means, standard deviations, confidence intervals, skewness, kurtosis and Kolmogorov-Smirnoff test (K-S) for the Lability Scale, the five identified subscales, AEI subscales and the RPQ*

<u>Variable</u>	<u>Mean</u> <u>(SD)</u>	<u>95% CI</u> <u>Lower</u>	<u>95% CI</u> <u>Upper</u>	<u>Skewness</u> <u>(SE)</u>	<u>Kurtosis</u> <u>(SE)</u>	<u>K-S</u> <u>(sig. p-value)</u>	<u>N</u>
Intuitive Cognition	69.33 (15.47)	67.23	71.53	-.43 (.18)	.00 (.35)	.070 (.028)	192
Conceptual Cognition	39.36 (7.06)	38.36	40.37	-.22 (.18)	-.63 (.35)	.090 (.001)	192
Ego-Orientated Cognition	32.47 (8.21)	31.30	33.64	-.12 (.18)	.59 (.35)	.052 (.200)	192
Emotional Interpretation	31.80 (5.60)	13.46	14.60	-.53 (.18)	1.65 (.35)	.074 (.013)	192
Analytical Cognition	14.03 (3.97)	13.46	14.59	-2.09 (.18)	4.51 (.35)	.216 (.000)	192
Lability Scale	186.98 (25.07)	183.42	190.55	-.23 (.18)	-.26 (.35)	.060 (.200)	192
AEI Experiences	50.69 (5.67)	49.88	51.49	-.731 (.18)	-.177 (.35)	.17 (.00)	192
RPQ	141.30 (19.80)	138.48	144.12	-.26 (.18)	-.37 (.35)	.08 (.003)	192

*Note: **bold** font indicates deviations from normality where data were converted to z-scores and significance calculated: $z\text{-score} = s - 0/SE$. The resulting value is significant if greater than 1.96 for $p < .05$.*

The initial descriptive statistic results for the five factors in Table 4.6 are informative as they show that there are a significantly negative skewness values for the distributions on Intuitive Cognition, Emotional Interpretation and Analytical Cognition meaning that there is a build-up of high scores in those three factors and the subscales. It is interesting to note whether or not these high scores are more indicative of individual lability in the following inferential analyses. In addition, there are also obvious negative skewness values for the two subscales of the AEI indicating that overall, participants showed high scoring levels in both experiences of anomalous phenomena and their own perceived abilities. These latter results for the AEI are of interest in showing either that the sample are not a good representative of a larger population, in having taken the survey with a prior interest in paranormal phenomena. Or, that in fact, the sample is representative of an ordinary population who may be willing to share personal exceptional experiences and a belief in their own inherent abilities.

4.10.2. The Five Factors: Relationships and differences with AEI subscales and the RPQ

Due to such deviations from the assumptions of normality non-parametric correlational analysis using Spearman's rho was performed to gauge the relationships between the five factors of the LS, the two subscales of the AEI and the RPQ as shown in Table 4.7.

Table 4.7 Correlation matrix showing the relationships between the five factors of Intuitive Cognition (IC), Creative Cognition (CC), Ego-Orientated Cognition (EGO), Emotional Interpretation (EI), Analytical Cognition (AC) and the two subscales of the Anomalous Experience Inventory, Anomalous/Paranormal Experiences (AEIEX) and Anomalous/Paranormal Abilities (AEIAB), and the Rhine Psychokinesis Questionnaire (RPQ)

Variables	IC	CC	EGO	EI	AC	AEIEX	AEIAB	RPQ
IC	—							
CC	-.09	—						
EGO	.52**	-.00	—					
EI	.46**	-.18*	.31**	—				
AC	.02	-.03	.02	-.01	—			
AEIEX	-.64**	.07	-.34**	-.47**	.15*	—		
AEIAB	-.54**	.02	-.22**	-.24**	.05	.67**	—	
RPQ	-.56**	.02	-.34**	-.34**	.13	.72**	.61**	—

Note: ** $p < .01$ level (2-t); * $p < .05$ level (2-t); $N = 192$. AEIEX = Anomalous Experience subscale; AEAB – Anomalous Abilities subscale; RPQ = Rhine Psychokinesis Questionnaire; IC = Intuitive Cognition; CC = Conceptual Cognition; EGO = Ego-Orientated Cognition; EI = Emotional Interpretation; AC = Analytical Cognition

Results found that there were significant moderate positive relationships between Intuitive Cognition and Ego-Orientated Cognition, ($rs = .52, p < .01$) and Emotional Interpretation, ($rs = .46, p < .01$). This showed that levels between these factors increased correspondingly. Intuitive Cognition had strong negative relationships with Anomalous Experiences, ($rs = -.64, p < .01$); Anomalous Abilities, ($rs = -.54, p < .01$) and Psychokinetic Experiences, ($rs = -.56, p < .01$). This showed that as levels of IC increased, levels of the AEI subscales and the RPQ decreased.

Creative Cognition had a small significant negative relationship with Emotional Interpretation, ($r_s = -.18, p < .05$), which showed that as levels of CC increased, levels of EI decreased.

Ego-Orientated Cognition had a significant moderate positive relationship with Emotional Interpretation, ($r_s = .31, p < .01$), which showed that levels of EGO and EI increased correspondingly. There were moderate negative relationships with Anomalous Experiences, ($r_s = -.34, p < .01$); Anomalous Abilities, ($r_s = -.22, p < .01$) and Psychokinetic Experiences, ($r_s = -.34, p < .01$). This showed that as levels of EGO increased, levels of AEIEX, AEIAB and RPQ decreased.

There were significant negative relationships between Emotional Interpretation and Anomalous Experiences, ($r_s = -.47, p < .01$); Anomalous Abilities, ($r_s = -.24, p < .01$) and Psychokinetic Experiences, ($r_s = -.34, p < .01$). This showed that as levels of EI increased, levels of AEIEX, AEIA and RPQ decreased.

As expected, there were significant strong positive relationships between Anomalous Experiences and Anomalous Abilities, ($r_s = .67, p < .01$) and Psychokinetic Experiences, ($r_s = .72, p < .01$). This showed that as levels of AEIEX increased, so did levels of AEIAB and RPQ.

Also as expected, there was a significant strong positive relationship between Anomalous Abilities and Psychokinetic Experience, ($r_s = .61, p < .01$), showing that as levels of AEIAB increased, so did levels of RPQ.

In addition, independent sample non-parametric Mann Whitney U tests were conducted in order to explore the differences between male and female scores and females in relation to the five factors.

There was significant difference found between males ($Mdn = 64.00$) and females ($Mdn = 74.00$) for IC, $U = 3071.00, z = -3.46, p < .05, r = -.25$. There was significant difference found between males ($Mdn = 30.00$) and females ($Mdn = 33.50$) for EGO, $U = 3597.50, z = -2.05, p = .04, r = -.15$. There was significant difference between males ($Mdn = 30.00$) and females ($Mdn = 33.00$) for EI, $U = 2773.00, z = -4.26, p < .05, r = -.31$. There was significant difference between males ($Mdn = 54.00$) and females ($Mdn = 50.00$) for AEIEX, $U = 3568.50, z = -2.13, p = .033, r = -.15$. There was significant difference between males ($Mdn = 149.50$) and females ($Mdn = 137.50$) for RPQ, $U = 3098.50, z = -3.38, p < .05, r = -.24$.

There was no significant difference found between males ($Mdn = 40.00$) and females ($Mdn = 40.00$) for Creative Cognition, $U = 4321.00$, $z = -.12$, $p > .05$, $r = -.01$. There was no significant difference found between males ($Mdn = 15.00$) and females ($Mdn = 15.00$) for Analytical Cognition, $U = 4037.50$, $z = -.88$, $p > .05$, $r = -.06$. There was no significant difference found between males ($Mdn = 29.00$) and females ($Mdn = 29.00$) for AEIAB, $U = 3837.50$, $z = -1.48$, $p > .05$, $r = -.11$.

The resulting line graph shows that on average, males had significantly lower scores on the IC, EGO and EI factors, but females had significant lower scores on AEIEX subscale and the RPQ, (see Appendix A.4, Figure 1.18).

Table 4.8 *Correlation matrix showing relationships between the Lability Scale factors and the measures of CCI, ECI, MOOD, OE and PPI*

<u>Variable</u>	<u>Intuitive</u>	<u>Conceptual</u>	<u>Ego-</u>		
	<u>Cognition</u>	<u>Cognition</u>	<u>Orientated</u>	<u>Emotional</u>	<u>Analytical</u>
			<u>Cognition</u>	<u>Interpretation</u>	<u>Cognition</u>
CCI	.94**	-.12	.45**	.39**	.33**
ECI	.61**	-.09	.79**	.75**	.05
MOOD	.10	.18*	.50**	-.08	.32**
OE	-.17*	.84**	-.05	-.18*	-.09
PPI	.71**	-.09	.53**	.38**	.24**

Note: ** $p < .01$ level (2-t); * $p < .05$ level (2-t); $N = 192$

As can be seen in Table 4.8 there are strong positive relationships between Factor 1 Intuitive Cognition and the Creative Cognition Inventory (Holt, 2007), ($r = .94$, $p < .01$); The Personal Philosophy Inventory (Persinger & Makarec, 1987), ($r = .71$, $p < .01$); Emotional Creativity Scale (Averill, 1999), ($r = .61$, $p < .01$) and a weaker negative relationship with Goldberg's Openness to Experience Scale (Goldberg, et al., 2006), ($r = -.17$, $p < .05$), indicating that as levels of Intuitive Cognition become higher, corresponding levels of Openness to Experience become lower.

For Factor 2 Conceptual Cognition, there is a strong positive relationship with Goldberg's Openness to Experience Scale (Goldberg, 1999), ($r = .84, p < .01$) and a weaker positive relationship with the 3 items from the Mood Scale (Akiskal, et al., 1995), ($r = .18, p < .05$).

For Factor 3 Ego-Orientated Cognition, there are strong positive relationships with the Emotional Creativity Scale (Averill, 1999), ($r = .79, p < .01$) and the Personal Philosophy Inventory ($r = .53, p < .01$). There are further moderate positive relationships with both the 3 items from the Mood Scale (Akiskal, et al., 1995), ($r = .50, p < .01$) and the Creative Cognition Inventory (Holt, 2007), ($r = .45, p < .01$).

Factor 4 Emotional Interpretation has a strong positive relationship with the Emotional Creativity Inventory (Averill, 1999), ($r = .75, p < .01$) and further moderate positive relationships with the Creative Cognition Inventory (Holt, 2007), ($r = .39, p < .01$) and the Personal Philosophy Inventory (Persinger & Makarec, 1987), ($r = .38, p < .01$). There can also be seen a weak negative relationship with Goldberg's Openness to Experience Scale (Goldberg, 1999), ($r = -.18, p < .05$), indicating that as levels of Emotional Interpretation become higher, levels of Openness to Experience become correspondingly lower.

Finally, for Factor 5 Analytical Cognition there are moderate positive relationships between the Creative Cognition Inventory (Holt, 2007), ($r = .33, p < .01$); the 3 items from the Mood Scale (Akiskal, et al., 1995), ($r = .32, p < .01$) and the Personal Philosophy Inventory (Persinger & Makarec, 1987), ($r = .24, p < .01$).

4.10.3. Differences between genders

In addition, independent sample non-parametric Mann Whitney U tests were performed in order to explore the impact of gender in relation to total individual liability scores and scores on the AEI and RPQ.

Findings showed that there was a significant difference between males and females in regards to LS scores with a small effect size, $U = 2947.00, z = -3.79, p < .05, r = -.27$. There was also a significant difference in scores of the AEI between males and females with a small effect size, $U = 8517.50, z = -2.27, p < .05, r = -.16$. There was a significant difference between males and females in relation to RPQ scores with a small effect size, $U = 3098.50, z = -3.38, p < .05, r = -.24$. It was noted that the pattern for both RPQ and AEI showed males having higher scores overall compared to females. Subsequent eye-balling of the line graph

showed that males had distinctly lower individual LS scores compared to females (see Appendix A.4, Figure 1.17), although had higher scores for both AEI and RPQ.

4.11. Discussion

The survey was intended to aggregate data from five individual measures of creativity, Openness to Experience, mood and neurological activity in order to develop a scale operationalising individual lability from subsequent factor analysis. Initially, correlational analyses were performed between the battery of five individual difference measures within the survey. On the whole, there were significant positive relationships found between the measures which offers encouragement as to deriving an underlying shared dimension of individual lability. However, Openness to Experience scores correlated negatively with both measures of creativity and epileptic-like neurological activity. In addition, mood scores did not achieve significant correlations with either emotional creativity scores or Openness to Experience scores. This suggests that mood states may not be applicable to either creativity aspects of openness. However, there was only one item retained relating to mood and therefore is not able to show a rounded view of how subjective mood states may interact with other individual processes.

Further relationships were explored between the battery of five measures and the two parapsychological measures. There were significant negative correlations between the scores of neurological activity, both aspects of creativity and Openness to Experience with both parapsychological measures. These show that as levels of these individual difference measures increase, the levels of both parapsychological measures decrease. Once again only Mood scores did not achieve any significant correlations with either the psychokinetic experiences or anomalous experiences. These preliminary findings suggest that contrary to previous theoretical assumptions, particularly those regarding mental health issues, high levels of forms of paranormal belief and experiences do not assume corresponding high levels in such flexible personality traits linked to emotions, creativity and neurological activity (Hergovich, Schott, & Arendasy, 2008). Although Schmeidler (1974) had previously found strong associations between persons claiming to have paranormal beliefs and abilities and personality traits the study was concerned with specific individuals working as professional mediums and clairvoyants. The findings from the current study has gained a sample from a wider population which disabuses the notion that persons with high levels of paranormal

belief are so easily categorised. Certainly, the lack of a strong relationships between RPQ with the personality trait of Openness to Experience (OE) may be seen as being rather surprising, as the majority of parapsychological research exploring aspects of personality have theorized that exhibiting such a trait may necessarily be conducive not only to alternative paranormal beliefs but also PK experiences (Chant, Gow, & Lang, 2004; Gow, 2009).

The Lability Scale initially consisted of 110 which were further amended to 71 items following factor analysis with a strong overall internal reliability ($\alpha = .86$). The factor analysis identified an orthogonal five factor structure with Cronbach's alphas ranging from .42 to .92: Intuitive Cognition ($\alpha = .92$); Conceptual Cognition ($\alpha = .42$); Ego-Orientated Cognition ($\alpha = .78$); Emotional Interpretation ($\alpha = .71$); and Analytical Cognition ($\alpha = .85$). The fifth factor of Analytical Cognition consists of only 5 items, which is at the bare minimum to be considered a factor as recommended by Kline (1994) – rather than as simply a 'bloated specific' – and its continued inclusion is evaluated with further usage of the Lability Scale. The factors were clearly defined and the primary individual lability factors comprised of items which followed previous expectations. The factor analysis processes and subsequent reliability analyses has produced an operational tool with which to explore individual lability. The inherent five factors reflect aspects of individual lability worthy of consideration in their own right and which warrant further exploration. The development of the Lability Scale, when compared to the previous methods of assessment using a battery of unstandardized measures, offers a far more accessible and concise perspective on individual lability. The necessity to construct a singular psychometric tool exploring individual lability is especially apparent when reflecting back to the theoretical models of lability proposed by Stanford (Stanford, 1978) and Braud (1980; 1981). Braud, in particular, related individual lability to various other individual processes, using measurements of memory and arousal within his investigations of individual lability (Braud, 1980b; 1980e). For the purposes of the following research it is yet unclear how these factors relate to the production of PK-RNG effects. However, it's expected that they may prove to be useful in relation to future studies exploring lability aspects and gender differences, types of paranormal belief and coping responses amongst others.

It has not yet been possible to fully assess construct validity as the lability instrument created for this research has yet to be used in further studies. However, Coolican (2004), observes that conducting factor analyses on psychometric instruments and identifying

inherent factors is, in itself, a form of construct validity, albeit only able to offer supporting evidence of suitability, rather than concrete proof.

Relationships were explored between the five identified factors and parapsychological measures of anomalous experiences psychokinetic experience. The scores from these two parapsychological measures were also aggregated to show an overall score for paranormal belief. Significant correlations were found to be negative between four of the five factors – as scores for the factors increased, parapsychological levels for the separate measures and the summated scores decreased. However, there was a noticeable lack of any significant correlations between the fifth factor Analytical Cognition and all parapsychological scores. This result may be understood by considering that items within Analytical Cognition are concerned with the reality of self and rational, logical thought – aspects assumed to be the complete opposite to those needed to enhance non-conventional beliefs or experiences (Irwin, 2000), and which may also aid in the understanding of how disbelief in the paranormal is generated (Clarke, 1995).

The differences between the genders was also considered in regards to the five factors. Findings showed that there were significant differences between male and female scores and females for the subscales of Intuitive Cognition, Ego-Orientated Cognition and Emotional Interpretation. On average, males were observed to score lower on these subscales than females. There was no difference between gender for Conceptual Cognition or Analytical Cognition. That females scored higher on the subscales relating to emotion and self-awareness supports previous research by Clarke (1993; 1995) who found that females were more concerned with aspects relating to the self compared to males, who were more concerned with the impact of external factors. In addition, this focus on self and emotions by females is also hypothesized by the work of Houran and Lange (1997b) when investigating precepts surrounding haunting phenomena and using the AEI. As predicted in their studies, females were found to score higher on items relating to fear of the paranormal, believed to have generated from internal state rather than influenced by external factors. However, when differences between the genders were explored in relation to the parapsychological measures, there was found to be a significant difference between males and females regarding psychokinetic experiences. Inspection of a line graph showed that on average, males had higher scores for such experiences. This opposes information garnered from the meta-analysis of reports of spontaneous PK experiences which suggests that females are more likely to believe in and experience PK (Rhine, 1986). This findings highlights the need for a scale such

as the Rhine Psychokinesis Questionnaire (Simmonds-Moore, Rhine Feather, & Gadd, 2010) which is specifically dedicated to mind over matter events. Especially in the light of the results have also shown that there was no significant difference between the genders for anomalous experiences. If this more general tool of the AEI, with only 3 PK items, had been used to assess PK events for the purposes of this study, then the subsequent findings may not have been an accurate representation of the participants' PK experiences.

Differences between the genders for scoring on the Lability Scale were also taken into consideration, with findings showing a significant difference between males and females. Inspection of the line graph illustrated that on average males had scored lower on individual lability. This apparent difference is encouraging in understanding the nature of individual lability even at this early stage of the research. It's interesting to take gender into account when performing analyses on scores from the Lability Scale throughout the following series of empirical PK-RNG studies.

Identified limitations of the study must be offered. Firstly, the need for a larger sample. The nature of an online survey has the ability to gain a varied sample population. However, the advertising for the survey was primarily via known parapsychological communities, forums and the university community. Although, this may have enabled the apparent skewness in the scores for anomalous experiences, it cannot be determined that this has unduly effected the inferential test results. In addition, the time-line of 8 weeks for the running of the survey restricted the amount of potential participants and ideally, according to Kline (1999) for good a priori power, over 500 participants would have been required. Future research may consider additional items relating to mood states in order to gauge a broader perspective of how it impacts on individual lability and also experiences of parapsychological. The initial battery of measures only included three items which were then further reduced to only one during the refinement of the Lability Scale using factor analysis. This is in line with previous research investigating spontaneous PK effects in real-world environments (Rogo, 1980; 1980; Roll, 1983) which proposed that individual agents were believed to have repressed negative emotions and also from discussing experiences with 'gifted' subjects. For example, in a recent interview, Felicia Parise stated that she knew when PK effects were going to occur when she began to feel anxious (Pilkington, 2013). Thus, the results obtained from the survey should be deemed exploratory and additional usage of the developed Lability Scale is necessary in order to test construct validity and efficacy.

4.11.1. Chapter Summary

The present Lability Scale can be seen to offer a more efficient tool with which to explore lability within individual differences, especially when compared to the succession of various measures employed within previous parapsychological research (Martin, Drennan, & Roe, 2010). The newly developed Lability Scale not only allows ease of measurement, but also generates greater understanding of a construct that is still regarded as being relatively ambiguous. At this time, it is still unclear as to whether an individual may be defined as being ‘labile’ and whether such a classification necessitates consistently high levels of lability throughout many aspects of individual differences – psychological, cognitive, emotional, behavioural and physiological – or whether there are only key aspects integral to labile capabilities and therefore, possibly also to psi effects.

Activating an online survey encompassing not only the construct of lability, but also able to explore individual paranormal beliefs and specific psychokinetic experiences had not been attempted previously – primarily due to the lack of information on PK and the various aspects involved. In this respect, thanks must be given to Christine Simmonds-Moore for her permission to use the newly developed Rhine Psychokinesis Questionnaire (Simmonds-Moore, Rhine Feather, & Gadd, 2010), which, at the time of writing, was still awaiting psychometric evaluation and is dedicated specifically to the various aspects associated with psychokinetic experiences – including deliberate exertion of will-power and electrical interference.

In regards to the results, initial factor analyses on the aggregated scores from the five individual difference measures allowed for the identification of five factors with good internal reliability. These five factors and the scores from the overall Lability Scale were analysed against the parapsychological measures to investigate the relationships between both paranormal beliefs and psychokinetic experiences. Results showed that there was a definite trend towards high levels of lability corresponding to low levels of both paranormal belief and psychokinetic experiences. Reassuringly, these results mirror previous experimental PK-RNG results from which this study has taken its cue and lend further support to theories such as Stanford’s Conformance Behaviour Model (1978), regarding the interaction between differing lability systems mediating the manifestation of psi effects.

Furthermore, the impact of possible gender differences on both paranormal beliefs and experiences and individual lability was touched on within the analyses in order to explore

further the anecdotal assumptions and theories relating to the individual agents of PK activity. The preliminary results are curious in that they illustrate a significant difference between males and females in regards to parapsychological factors and individual lability. Males have been shown to have lower levels of both and it is interesting to see whether this distinct pattern occurs further within the findings from the subsequent empirical studies and if it warrants further investigation.

In conclusion, the developed Lability Scale enables a more comprehensive understanding of individual lability. It is possible to not only gain an overall score of individual lability for an individual, but also divide scores into different categorical levels, such as low, medium and high lability. In following with previous research, this will go some way to investigate the potential interaction between individual lability and external random system lability and how this may impact on the production of PK effects. With the development of a comprehensive and reliable measure for individual lability and the identification of specific lability dimensions, the next step is to now build upon these preliminary findings with continued use of the new Lability Scale in the subsequent three experimental PK-RNG studies, (presented in Chapter Five and Chapter Six).

4.11.2. Additional factor analysis on the survey data exploring unrotated factor loadings and oblique rotation

Following advice from independent advisors, it was requested that the initial survey data was explored further in relation to reporting the unrotated orthogonal factor structure. This would serve as a predictor of a scale with loadings on a singular component. In addition, to verify if the identified factors from the orthogonal rotation are independent from one other by performing an oblique rotation, which would signpost any relationships between the components.

Item	Components		
	Factor 1	Factor 2	Factor 3
	35 Items	1 Item	6 Items
CCI_7 <i>A sense of communicating with a deeper self</i>	.75		
CCI_28 <i>A sense of communicating with something other</i>	.72		
CCI_29 <i>A sense of being in tune with nature or the universe</i>	.68		
CCI_18 <i>A sense of purpose that seems to come from beyond the self</i>	.66		
ECL_5 <i>I believe that people should work on their emotional development as hard as they work on their intellectual development</i>	.64		
CCI_3 <i>Ideas arising whilst dreaming</i>	.63		
CCI_12 <i>Meditation</i>	.62		
CCI_13 <i>Paying attention to visual imagery</i>	.60		
CCI_10 <i>Following your intuition</i>	.60		

ECL_8	<i>I sometimes experience feelings and emotions that cannot be easily described in ordinary language</i>	.59		
CCI_2	<i>Trusting hunches or instincts</i>	.59		
CCI_26	<i>Positive emotions, e.g. joy, excitement, euphoria</i>	.59		
CCI_11	<i>Ideas arising as falling asleep or waking up</i>	.59		
ECL_25	<i>My emotions are a major source of meaning in my life: without them, my life would lack significance</i>	.58		
ECL_1	<i>Making discoveries through trial and error</i>	.58		
ECL_7	<i>I think about and try to understand my emotional reactions</i>	.58		
PPI_6	<i>Sometimes in the early morning hours between midnight and 4 a.m. my experiences are very meaningful</i>	.58		
CCI_22	<i>Paying attention to auditory impressions</i>	.58		

CCI_21 <i>A sense of channelling information</i>	.57		
ECI_21 <i>When responding emotionally, I can be quite inventive and innovative</i>	.57		
ECI_14 <i>I like music, dance and paintings that arouse new and unusual emotional reactions</i>	.56		
ECI_17 <i>My emotions help me achieve my goals in life</i>	.56		
CCI_27 <i>Paying attention to bodily feelings</i>	.56		
ECI_16 <i>I have emotional experiences that would be considered unusual or out of the ordinary</i>	.55		
CCI_14 <i>Experiences of losing track of time when involved in creative work</i>	.55		
ECI_18 <i>When in emotional situations, I tend to respond in a unique manner</i>	.54		
CCI_25 <i>Non-verbal modes of thinking</i>	.54		

ECI_23 <i>I would have to be a poet or novelist to describe the kind of emotions I sometimes feel, they are so unique</i>	.54		
ECI_12 <i>The way I experience and express my emotions helps me in my relationships with others</i>	.54		
CCI_24 <i>The release of negative emotions</i>	.53		
CCI_16 <i>Luck, chance, 'fortunate accidents'</i>	.53		
PPI_4 <i>When I have a tough decision to make a sign will be given and I will know what to do</i>	.51		
ECI_30 <i>I am able to experience a large number of different emotions</i>	.51		
OE_6 <i>Have a vivid imagination</i>	.50		
CCI_5 <i>Sudden moments of inspiration in waking life</i>	.50		
CCI_19 <i>Recombining existing elements in new ways</i>		-.51	
CCI_6 <i>Rational, logical thought</i>			.66

MOOD_1 <i>My mood often changes from happiness to sadness, without my knowing why</i>			.66
MOOD_2 <i>I have frequent ups and downs in mood without apparent cause</i>			.66
CCI_4 <i>Methodical and systematic problem solving</i>			.63
CCI_8 <i>The careful selection of ideas</i>			.60
CCI_20 <i>Working with a set goal or outcome in mind</i>			.57

The unrotated loadings for the orthogonal rotation show only 3 potential factors, with a similar range of items for Factor 1 for both the unrotated and rotated structures. However, there are concerns that Factor 2 consists of only 1 item and is likely to be a bloated specific.

Additional principal component analysis (PCA) using an oblique rotation was conducted on the original survey data in order to explore the factor structure further. A direct oblimin rotation was chosen based on the premise that the inherent factors may be correlated and factor loadings restricted to being above .50 which, according to Costello and Osbourne (2005) would indicate a solid factor. The scree plot in Figure 4.3 showed a potential for five factors accounting for 35.65% of the cumulative variance (Table 4.10), similar to the initial orthogonal rotation.

Figure 4.3

Scree plot identifying 5 components having eigenvalues over 1 to be retained from an oblique rotation

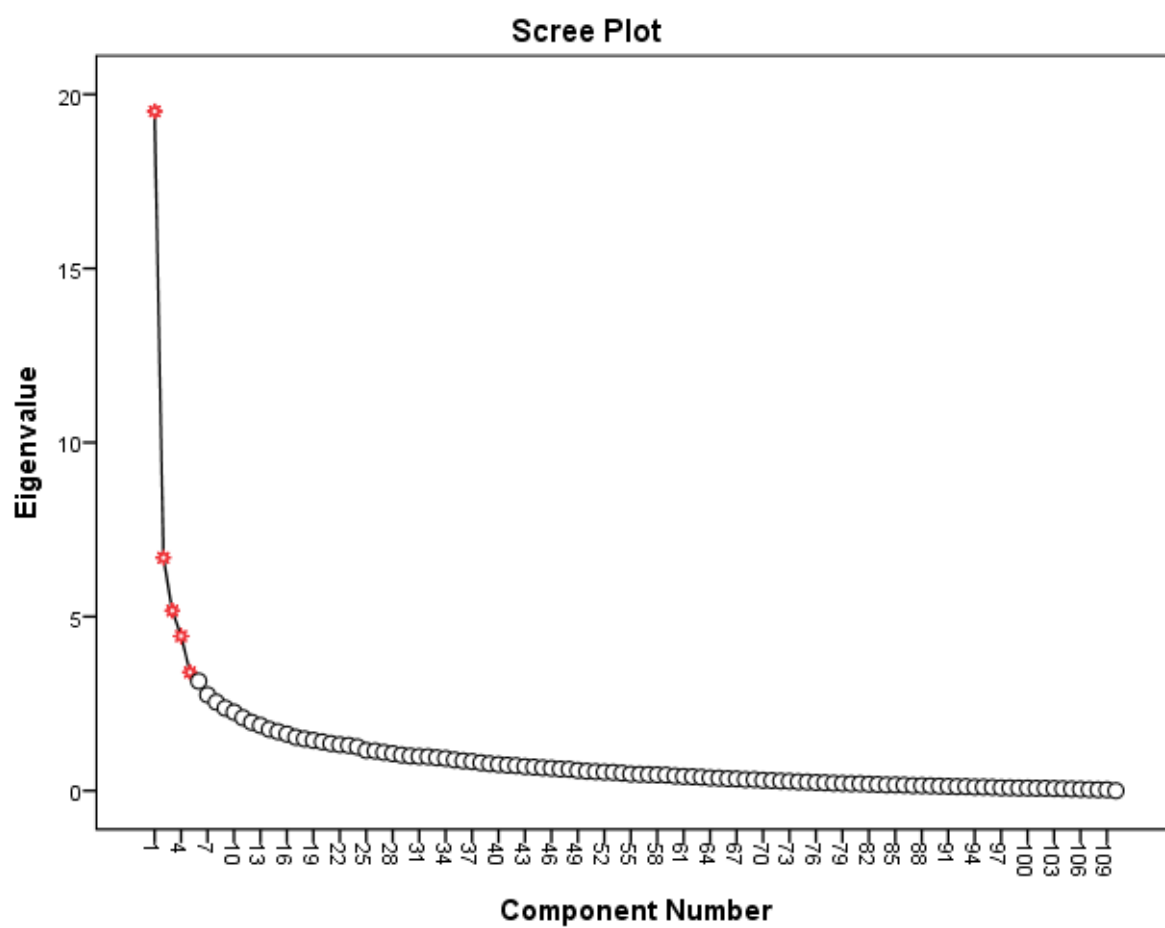


Table 4.10

Table showing factor loadings from an oblique rotation

Factors	Initial Eigenvalues			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
Factor 1	19.51	17.74	17.74	19.51	17.74	17.74
Factor 2	6.69	6.08	23.82	6.69	6.08	23.82
Factor 3	5.17	4.70	28.52	5.17	4.70	28.52
Factor 4	4.44	4.04	32.56	4.44	4.04	32.56
Factor 5	3.40	3.09	35.65	3.40	3.09	35.65

The loadings for the 5 factors were inspected on the pattern matrix (Table 4.11) resulting from the oblique rotation as it shows the unique contribution of each item to each factor.

Table 4.11

Pattern matrix for the 5 factors identified from an oblique rotation

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
CCI_24	.69				
CCI_26	.67				
CCI_21	.65				
CCI_25	.54				
OE_3R		.83			
OE_3		.72			
OE_1		.57			
CCI_6			.91		
CCI_4			.88		
CCI_8			.87		
CCI_20			.80		
ECL_4				-.66	
ECL_9				-.51	
ECL_29					-.90

Furthermore, for comparison, the loadings on the structure matrix (Table 4.12) were inspected for potential relationships between each variable, shown if the same items were loading onto different factors, which as not the case.

Table 4.12

Structure matrix for the five factors identified using an oblique rotation

Item	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5
CCI_26	.76				
CCI_24	.75				
CCI_21	.72				
CCI_25	.65				
CCI_27	.63				
CCI_28	.61				
CCI_22	.59				
CCI_29	.59				
CCI_17	.57				
CCI_18	.52				
OE_3R		.82			
OE_3		.73			
OE_1		.65			
OE_1R		.55			
CCI_6			.91		
CCI_4			.88		
CCI_8			.87		
CCI_20			.81		
PPI_14			.52		
PPI_13			.51		
ECI_4				-.73	
ECI_9				-.63	
ECI_12				-.57	
ECI_21				-.55	
ECI_29					-.89
ECI_29R					.87

Inspection of the component correlation matrix confirms that these 5 factors have little or no relationships between any of the factors (Table 4.12). Thus, it can be assumed that the factors are independent of each other and the results of the initial orthogonal rotation can be trusted.

Table 4.12

Component correlation matrix for the 5 factors identified using an oblique rotation

Factor	1	2	3	4	5
1	_____				
2	.04	_____			
3	-.02	-.09	_____		
4	-.06	.02	-.03	_____	
5	.09	-.03	-.08	-.17	_____

CHAPTER FIVE

INDIVIDUAL LABILITY AND PERCEIVED STRESS: EXPERIMENT ONE

5. Introduction

Chapter Four described the development of the Lability Scale (LS) via factor analysis measure construction methods. This current five-factor measure contains five subscales categorised as: Intuitive Cognition, Conceptual Cognition, Ego-Orientated Cognition, Emotional Interpretation and Analytical Cognition. The LS was found to have good internal reliability overall (Cronbach's $\alpha = .86$). Four out of the five subscales also showed good internal reliability with Cronbach's α above .65 with only Conceptual Cognition having a Cronbach's α of .42. It was proposed that the development of the LS was to gain a better understanding of individual lability processes. Furthermore, when used in conjunction with an external lability source such as a random system, to explore the optimal conditions of PK effects in a laboratory environment. Therefore, the aim of this chapter is to explore the validity of the LS further by using it within the first of a series of three empirical PK-RNG studies.

The studies presented in the following chapters aimed to explore the overall question of 'what are the optimal conditions for PK effects in a laboratory setting?' The current studies also consider the role of individual and environmental factors as being possible contributing processes for PK effects (as reviewed in Chapter Two). Therefore, in addition to exploring the interaction between individual lability and RNG lability three further variables were included within each of the three studies. Experiment One explored the impact of individual stress; Experiment Two explored the participant-researcher interaction; Experiment Three explored goal-directed striving. The rationale behind the inclusion of these particular variables stem from findings from previous empirical research and from anecdotal evidence from observational studies with 'gifted' and/or PK individual agents. Although elements of this previous research were reviewed previously in Chapter Two, they are discussed in more detail within this chapter. In brief: PK effects in individual PK agents have been associated with psychological and physiological stress (Pratt & Keil, 1973; Roll, 1983; 2007). This chapter outlines the procedure and the results of an empirical PK-RNG study exploring the contribution of individual lability and perceived subjective stress. In order to focus attention on the included variables the series of studies were conducted using a standardised procedure

utilizing the newly developed Lability Scale and an I Ching task which is described within this chapter.

In order to understand the rationale behind employing PK-RNG studies to explore the lability interaction, this chapter begins by reviewing previous research exploring the contribution of stress, physiological arousal and anxiety to PK effects that has formed the basis for the current research.

5.1. Onset of ‘process orientated’ PK research exploring individual differences

Nevertheless, it was now imaginable to begin to discover the machinations involved in these observed capabilities, and the focus turned to the aforementioned ‘process-orientated’ research, which still attempts to provide evidence of cause and effect. The concept of an unconscious internal process being involved in manifesting PK effects has been included within various theories, including the noise reduction theories of Braud (1981) and Honorton (1977) and Stanford’s Conformance Behaviour Model (1978). In order to understand a phenomenon such as PK the context in which it arises must be explored. In this instance, the study is concerned with the manifestation of PK within an experimental environment. Researchers such as Rogo (1978; 1980) have theorised that PK manifestations may be the result of highly unsettled levels of emotional, psychological and physiological variables when exposed to stressful circumstances – resulting in an extreme form of maladaptive coping response. In considering spontaneous PK occurrences, Gauld and Cornell (1979) offer that in some instances possible emotional turmoil within individuals were unconsciously externalized, rather than exhibited in a physiological disorder, such as a rash or gastric problems, but admit that they are unsure as to how this could be achieved. The present chapter reviews the role arousal and stress may have on PK effects. The first sections concentrate on the nature of stress and coping strategies. The following sections introduce the role of arousal and stress in experimental PK research and related findings from observational studies using gifted individuals. The following section reviews the nature of stress and why it may have significance for PK effects.³

5.1.1. Stress and PK effects

The findings from such research argues for the effects of stress as a contributing factor in the manifestation of PK effects. Researchers such as Rogo (1974b; 1978) and Heath (1999;

³ It also proceeds to describe the present PK-RNG experiment incorporating the newly constructed Lability Scale to further assess the possible relationship between PK effects, levels of lability and individual stress state via levels of physiological arousal and ratings from a subjective measure.

2003) have certainly supported the idea that the emotional state of individuals involved in such phenomena is of great importance. They cite the impact of repressed aggression and inhibition within stressful situations in reports of real-world and experimental PK, with Rogo (1980) theorizing that pervasive tension in dysfunctional families is also indicative of producing PK effects. Yet, with the exact nature of stress still regarded as ambiguous, researchers have not been able to define whether it is the cause of a stressor or the individual's method of coping that may be critical to the production of PK effects. From the previous study subscales identified within the Lability Scale of intuition, the self and emotions only relate to psychokinetic experiences specifically. The negative correlations identified between lability subscales and PK experiences show that as levels of these lability factors decrease, levels of PK experiences increase. These findings are suggestive when presented with reports from real-world situations and observational studies of PK effects where individual agents are purported to exhibit some form of repressed psychological struggle. Therefore, the following sections detail what is known about the nature of stress and the effects on individuals, psychologically and physiologically and how they may relate to PK effects.

5.2. Theories of stress

There has been a variety of theories offered in regards to the functions and processes involved in the regulation of stress and corresponding coping responses, and investigations have become prevalent in scientific research across many different disciplines. As stated by Krohne (2002), in the main the theories revolve around stress as being either 'systemic' and based around physiology and psychobiology as proposed by Selye (1976) or 'psychological' and based on cognitive processes as offered by Lazarus and Folkman (1984). The acknowledged view consists of stress evolving either from an external stimulus or as an internal response, with the multi-dimensional components being able to interact with each other (Ursin & Olff, 1993). As such, it can be defined as a transactional relationship between an individual and the immediate environment and consisting of a multitude of factors and different processes (Lazarus & Folkman, 1984). Within psychology, stress as a process is the impact of stimuli on an individual, followed by activity in the cognitive processing system which then generates a response. Furthermore, stress can also be defined as being the actual experience of the individual having a stress response, affecting thoughts, feelings, behaviour and the body. Theorists do agree that a perceived loss of control is essential to the individual generating stress responses. Feelings of stress can never be totally eliminated, for as Sapolsky (1998) advises there are evolutionary reasons behind why stress responses are necessary, mainly to escape danger and predation. In evolutionary terms, it is essential for humans as

mammals to have developed such behavioural and physiological responses to stimuli, to be able to function efficiently in a possibly hazardous environment. The kinetic internal energy generated by the autonomic nervous system allows the individual to prepare for either offensive or defensive action – the ‘fight or flight’ syndrome (Cannon, 1932), – for self-preservation (Erikson & Ursin, 2006). In physiological terms, when an individual is presented with a perceived stressor, there is an immediate reaction in the central nervous system which then creates a pathway to the hypothalamus. The immediate physiological response, which causes a state of heightened arousal, has a direct relationship on the individual’s corresponding emotional reactions (Lazarus, Stress and Emotion., 1999). According to Selye (1956), non-specific physiological reactions occur subsequently to either a subjectively perceived positive or negative stimulus. Outlined in his General Adaptation Syndrome (GAS), the stress response is segmented into three distinct stages - that of alarm, resistance and finally a state of exhaustion (Selye, 1976). As Selye outlined in ‘The Stress of Life’ (1984) it is not conducive for the overall health of the physical body for the alarm stage (with its surge of bodily processes) to be unremitting. This initial stage is therefore, able to be produced for a short duration, and necessarily be followed by a second resistance stage in which the individual is able to assimilate physiological, cognitive and behavioural processes actively. The third stage of exhaustion occurs when the resources from the processes are depleted following prolonged exposure to stress.

However, the effects can be buffered by implementing coping strategies which can be effective in managing stress responses (Schonpflug & Battman, 1988). Indeed not all stress can be classed as negative. The positive effects of stress can be beneficial for aspects of performance observed in cognitive, behavioural or physiological actions in pressured situations – exams, sporting activities (Savage & Torgler, 2012), military activities and emergency situations (Matthews, 2008) where such heightened arousal is a useful tool for elite athletes and performers to produce optimal output.

5.2.1. Perception of stress

The majority of theories are consistent of what constitutes a stressor - either an exogenous or endogenous stimuli capable of producing stress. Perception of a stressor is generally subjective and relies on the individual’s historic experiences and personality traits (Folkman, 1984). In simpler terms, every individual responds in different degrees to a singular occurrence. What may stress one person severely can be cause minimal stress to another. The relationship between physiological arousal and the perception of stress has been

investigated since the earliest scientific laboratory based psychological endeavours involving animal behaviour (Yerkes & Dodson, 1908). The firing of neurons and hormones into the blood vessels from the central nervous system in reaction to stimuli occurs within a matter of milliseconds, making the physiological arousal process almost immediate. In recent years, it has been theorised that to achieve optimal performance in task based activities, it is in fact necessary for the body to have achieved a moderate level of arousal (Braud, 1981). A sustained increase in arousal counters any potential and can cause detriments, whereas not responding may not cause any significant changes either towards a positive or negative outcome. It may also cause a state of hyper vigilance if sustained for long prolonged periods of time, which can further denigrate judgement and decision making (Janis & Mann, 1977). Stress is not the sole causal pathogenic factor of related disorders and diseases, but has got a high proportion of participation in the development. It has now been accepted that an accumulation of what are termed everyday or daily stressors may have similar and as consequential effects as acute traumatic exposure to stressors (Serido, Almeida, & Wethington, 2004). Potential psychopathology such as Posttraumatic Stress Disorder and mental health problems (LeardMann, Smith, Smith, & Ryan, 2009); cardiovascular problems (Dimsdale, 2008); and those that involve the suppression of the immune system (Seegerstrom & Miller, 2004), may all be related to ineffective coping responses to stressful circumstances.

5.2.2. Coping strategies

According to Ursin (1988), stimuli activate processes in the central nervous system, resulting in coping responses and behaviours. The expectancy subsequently arises from the stored experience of that stress response. Further stress is generated when the presumed expectancy of a positive outcome becomes distorted. Eysenck (1988) states that the levels of stress experienced by an individual are dependent on the relationship between the environment and various individual differences. Thus, the resulting coping responses correspond to the resources of each individual, with some individuals attaining high levels of stress through an inability to cope, whereas others may cope effectively enough to mediate stress levels. In the development of the renowned State-Trait Anxiety Scale (STAI) Spielberger et al. (Spielberger, Gorsuch, & Lushene, Manual for the State-Trait Anxiety Inventory (STAI), 1970) noted that there is a general assumption that in regards to correlates with personality, that high levels of trait anxiety are more susceptible to the perception of stress than persons with low levels of trait anxiety. In so much that when presented with a stressful situation, these individuals have a greater increase in state anxiety as the worries of high trait anxiety individuals may be more easily stimulated during these periods. Lang

(1971) argues that there are three separate responses that amalgamate into what is perceived as becoming anxious – that of behavioural, physiological and verbal. However, it has been found that these three systems do not aggregate concordantly, with measures from different systems failing to correlate. Beck (1997) states that the choice of coping strategy employed is dependent on personality factors which have the ability to either facilitate or constrain coping. For example, extraversion has a positive relationship with emotion, avoidant and goal focused coping styles for males and females, whereas high levels of neuroticism have a positive relationship with avoidant coping strategies (Gomez, Holmberg, Bounds, Fullarton, & Gomez, 1999).

5.2.3. Different forms of coping strategies

It is accepted that there are three main mechanisms for the coping strategies implemented by the individual. These are emotion focused responses, problem focused strategies and avoidant focused strategies (Skinner, Edge, Altman, & Sherwood, 2003; Matud, 2004). The use of avoidant or a repressed coping strategy is viewed as a maladaptive coping technique as the individual attempts to continuously circumnavigate the source of stress rather than address it for an extended period of time – persistent avoidance of a stressor may last for years and alter an individual's behaviour inexorably. Previous research has found that between the two, it is the problem based method that is more successful in managing stress (Matud, 2004). This strategy is more action orientated, and allows the individual to actively contribute to the reduction of effects (Howerton & Van Gundy, 2009). However, this strategy is not entirely appropriate for all situations. A problem may occur that an individual is not able to control manually. As noted by the research of Heppner et al. (Heppner, Cook, Wright, & Johnson, 1995) whilst developing a new goal-orientated coping measure, persistently employing such action based behaviour then only serves to exacerbate the stress. It has been observed that coping strategies need to be as malleable as possible over different contexts, as stated by Lazarus and Folkman (1984) in their seminal study, there is no one strategy that is completely appropriate for every stressor encountered.

5.2.4. Problem-focused strategies

Problem-focused strategies involve viewing the source of stress as a problem, which therefore, should have a logical solution which requires action. This form of strategy is considered as being more effective in reducing stress responses. However, it is not an ideal for managing all forms of stressors and there are obvious instances where the source of stress does not have a solution and cannot be 'solved'. When such a coping strategy fails, persons

who use this technique may not have alternative resources and so become trapped in a loop of ineffective coping (Heppner, Cook, Wright, & Johnson, 1995).

5.2.5. Emotion-focused strategies

Emotion-focused coping strategies have a reliance on identifying the emotive arousal prompted by a stressor, and trying to transform any negativity into a positive state. However, this does not allow much scope for allowing a significant control over the stressor, and therefore is not considered to be a completely successful method of coping. Behaviour may include internalising the emotions generated, from which not only can a state of frustration occur, but may lead to an individual exhibiting physiological disorders as arousal is continual (Totman, 1990). Often, this form of coping may be the foundations of physiological and emotional disorders such as depression, skin and gastric disorders, hair loss (Wang, et al., 2007).

5.2.6. Gender differences in coping strategies

Within stress and coping research there are evident gender biases to the form of coping strategies implemented by males and females (Baker & Berenbau, 2007). Females have more of a reliance on emotion-focused techniques - males primarily manage stress using problem or goal-focused techniques (Howerton & Van Gundy, 2009). Individuals must necessarily be able to alter strategies in regards to the stressors as they present themselves. For instance Ben-Zur and Zeidner (1996) found that during the Gulf War, females within the Armed Forces favoured goal focused strategies whereas males employed more emotion focused strategies. Following the end of the conflict in the face of everyday stressors this situation was reversed with females returning to emotion focused techniques and males to goal focused techniques. Research into the effects of everyday stressors show no significant differences between the genders for overall distress once daily stress is taken into consideration (Almeida & Kessler, 1998).

5.2.7. When coping strategies go wrong

Nowadays, daily stressors are perceived as being relatively commonplace and could include noise levels, work and family commitments. However, an accumulation of stress from such minor uncontrollable stressors can cause the same long-term physiological and cognitive impairments as an instance of trauma (Boals & Banks, 2012). Conversely, responses may be dulled or abnormal, as physiological processes become habituated to a state of chronic stress. Individuals who have learned habitual maladaptive coping strategies following an acute or

chronic stress may become show significant stress responses to daily stressors. Subsequently, such stress related disorders such as Posttraumatic Stress Disorder may occur (Elklit & Brink, 2004).

Inappropriate or ineffective coping strategies often manifest in maladaptive coping behaviours. Such behaviours appear on the surface to offer relief from the source of stress for the individual but actually can create further problems, including psychopathology. Examples of maladaptive coping behaviours may be observed with the use of alcohol, drug-taking, the onset of eating disorders and self-harm (Downey, Johnston, Hansen, Birney, & Stough, Investigating the mediating effects of emotional intelligence and coping on problem behaviours in adolescents, 2010). Such behaviours can preclude further psychopathology such as depression, schizotypy and health problems. Although early physicians such as Galen (LeShan, 1959) believed that stress was the direct cause of diseases such as cancer, it is not the sole pathogenic factor, but can be credited as a strong co-morbid contributing factor in the development of disorders and diseases. Furthermore, an accumulation of daily stressors may still have similar and as harmful effects as acute traumatic exposure to stressors (Serido, Almeida, & Wethington, 2004) which include Posttraumatic Stress Disorder (PTSD) and mental health problems (LeardMann, Smith, Smith, & Ryan, 2009); cardiovascular problems (Dimsdale, 2008); and the suppression of the immune system (Segerstrom & Miller, 2004). Conversely, the use of positive illusion also has a relationship with avoidant coping, whereby an individual with high levels of optimistic expectation refuses to acknowledge a stressful situation or the potential resulting effects (Scheier & Carver, 1985). Garnefski and Kraaj (2009), whilst exploring types of stressful life events and the subsequent impact they can generate, found maladaptive coping strategies within individual thought processes including rumination, self-blame and catastrophizing were particularly prevalent. However, maladaptive strategies are apparent not only within emotional processes but also exhibited in behaviours, which appear to cause more physical detriments. In support of this theory, Lindquist et al. (1997) discovered that in both genders actual perceived stressors within a work environment had no effect on blood pressure, but conscious behavioural coping methods such as excessive alcohol consumption and eating habits did.

Various theories of stress concur that a lack of appropriate control is contingent on whether a coping strategy is successful (Lazarus & Folkman, 1984). Coping strategies are employed not to completely rid the individual of the stressor, but to successfully manage or decrease the effects it may have caused. These theories have further offered that within an experimental procedure, it is not the manipulated stressor that activates the physiological

responses within an individual. Instead, this is determined by subjective coping styles. When placed under extreme stress, and conscious of the inability to control the situation, the individual may begin to panic. The capacity to think rationally dissolves and subsequent behaviour degenerates into more primal and maladaptive actions.

5.3. Stress responses and individual differences: A recipe for PK effects?

From research assessing individual participants' perceived stress states using questionnaires, it has been shown that there is a direct relationship between high trait anxiety and the negative effects of temporary stressors (Wofford & Goodwin, 2002). Schmeidler (1988) reviews the case for the relationship between anxiety and psi scores via the experimental PK-RNG work of Broughton and Perlstrom (1986; 1992). Using a PK game the participants were tested within two conditions – one where they were told that they were competing against persons within the immediate experimental environment; the second where they were told that they were competing against unseen persons away from the environment. Findings showed a significant negative correlation between PK scores and self-reported anxiety levels within the first condition. Further post hoc testing also showed the same significant negative correlation within the second condition. However, a criticism can be made of the self-reporting anxiety procedure, where participants completed the measure at home and not all were returned.

The theory that emotional tensions are the primary cause of spontaneous PK effects may be related to hormonal fluctuations. The majority of possible individual agents are reported as being female with a median age of fourteen years and therefore possibly within the throes of puberty (Roll, 1977; Rogo, 1980; Houran & Lange, 1997b). Indeed the dysregulation of the stress hormone cortisol at a young age is closely related to the development of psychopathology and stress-related disorders later in life (LeardMann, Smith, Smith, & Ryan, 2009). Related theories, including those of Stanford (1974b), who describes poltergeist activity as 'the externalization-of-responsibility', argue that it is the inability to control affective and emotional stability when exposed to an external stressor that produces PK effects or poltergeist activity. Thus, such phenomena may be seen as being an unconscious maladaptive coping response caused by lability levels within hormonal, affective, emotional and even behavioural states. At this time, it is unclear as to whether an increase or a decrease in lability would be a contributing factor, considering that chronic stress disorders present abnormally suppressed stress responses (Garnefski & Kraaj, 2009). Indeed, such a relationship may even be apparent in reverse – with the effects of chronic

stress altering lability. Furthermore, research has also provided a link between the effects of stress following traumatic instances and the onset of related hallucinations - a leakage of a dissociative, dreamlike state into waking consciousness (similar to the concept of transliminality) - which is normally held in check by neurological and cognitive processes. In addition, as presented by Siegel (1992), such a labile dissociative state can also be induced by a surprisingly large variety of means, including meditative practices; pharmacologically; sensory deprivation, as employed within a Ganzfeld environment; sleep deprivation; disease and disorders affecting neurological processes; and acute and chronic stress (Morgan, Hazlett, Wang, Richardson, Schnurr, & Southwick, 2001) – all of which are also proposed to be conducive to the production of psi phenomena (Rattet & Bursik, 2001).

It has already been established through reviewing the research on stress responses that there are pathways between physiology and individual mental states which are mediated by the autoimmune system. It has been acknowledged that PK appears to be more prevalent, both in spontaneous cases and within an experimental environment, with a reported subjective increase in physiological arousal (Braud, 1985). According to McConnell:

“...all spontaneous psychokinetic events entail physical power no greater than that expendable by one person in normal muscular activity.” (1983, p. 120).

So, in order to explore the role of subjective stress in the production of PK effects in the laboratory, it was necessary for researchers to incorporate a reliable and consistent method of assessment. Popular protocol to be found in experimental sessions is to judge the level of individual physiological and psychological arousal which can be gained through measurement of heart rate and cortisol levels and self-report scales. The following section details parapsychological studies which have considered the impact of state on psi and PK effects.

5.3.1. Psychological states and traits

Palmer and Kramer (1983) investigated the impact of internal states and temporal factors on PK-RNG by including an auditory stimulus within the design, which was thought from pilot studies, to produce a passive attention on the given PK task. Hypotheses given were firstly, that the auditory stimulus would be conducive for PK effects; and secondly, that PK effects were more likely to occur following the period of intention and/or a sudden change in cognition (being startled); thirdly, that there would be decline effects between and within attempted PK; fourthly, that there would be a differential effect between the two influencing periods; finally, that greater PK effects would be found during experimental sessions than

during non-influencing control sessions. The procedure involved forty-eight participants who sat in a room illuminated with minimal lighting. The sessions consisted of three sets of 2500 trials generated roughly every 18.5 seconds. In set 1 and set 3, participants were required to focus intention on producing either '1' or '0' on the monitor whilst either listening to the auditory stimulus or without, with the sets were counterbalanced. Participants remained blind to set 2, which assessed PK effects for cessation of intention. Sixteen participants were randomly assigned to Condition 1 (set 1 = stimulus/set 3 = without) with a 3 minute period in between the sets. Conditions 2 and 3 reversed this set combination, although Condition 3 varied with a sudden commencement of the stimulus in order to produce a startle effect. In addition, the researchers included different types of stimuli throughout the Conditions – drums, lively music and a relaxation exercise. Findings did not show that any of the hypotheses were supported, although the researchers did point out trends in the difference between experimental and control sessions.

Further investigations into the relationship between psychological traits and PK effects in PK-RNG studies was conducted by Schechter and colleagues (Schechter, Honorton, Barker, & Varvoglis, 1983). The researchers employed two types of PK-RNG game tasks which differed in the amount of feedback given and task orientation. The first game task was called 'Psi Ball', (a motor control task which has been outlined in previous experiments), for which no immediate feedback was given. The second game task called 'Volition' presented immediate visual feedback via a computer generated graph. The aim for the 10 participants was to produce either high or low values when instructed to do so from a pseudo random RNG. The 10 participants remained blind to the use of another RNG which also ran during the session to match the pseudo random RNG. Prior to the sessions, all participants completed a measure outlining general personal information including their belief and experience of psi effects, coupled with psychological inventories. It was predicted that there would be a significant negative correlation between psychological scale scores and scores from both Psi Ball and Volition. With all the data transformed into Z-scores, analysis for the relationship between psychological characteristics and RNG was performed using Fisher Exact Probability Tests and 2 x 2 contingency tables based on median splits. Unfortunately, the researchers did not record any significant relationships between psychological scores and the two PK-RNG scores. However, similarly themed future PK-RNG research may want to take into account the use of a larger sample than 10 participants in order to amplify the sensitivity of the analyses.

5.3.2. Arousal and anxiety

Within a review of psi-conducive states by Braud (1975) there is a somewhat brief addendum regarding the arousal of the individual nervous system in relation to psi effects, relating to earlier research conducted into psi-conducive states. Although Braud has previously stated that excessive amounts of effort by participants in performing psi tasks negated positive outcomes (1993). Findings suggest that such arousal is a necessary characteristic in producing psi effects – but it is uncertain as to whether it is due to the increase in focused attention caused by the heightened physiological arousal. Research by Crandall (1993) investigated motivation and anxiety on PK performance using a game based on racing virtual greyhounds around a track influenced by an RNG. Participants completed self-report measures on personality and then tested individually either in a competitive condition or a relaxed condition. Task success was merited with a cash reward. It was found that extraversion scores were significantly positively correlated with PK performance during the competitive condition, but not in the relaxed condition. Furthermore, that extrinsic motivation proved to be more of a hindrance when the participants were in a relaxed state, but more effective when the environment became more highly charged and arousal increased. This characteristic appears to have similar aspects to those seen within stress reactions, whereby it is known that moderate levels of arousal caused by stress can be beneficial when performing tasks (Lazarus & Folkman, 1984; Krohne, 2002).

In addition, research conducted by Hardy et al. (2007) on anxiety-induced performance catastrophes found that rather than performance being hindered by a relationship between cognitive anxiety and physiological arousal, it was instead mediated by individual effort within the given task. It may be that exerting a modicum of self-control mediates levels of perceived stress and physiological arousal. It has been stated that amounts of self-control are subjective to an individual and therefore is a resource with limitations (Muraven, Gagne, & Rosman, 2008). It is with this respect that exerting self-control to inhibit ‘unwanted’ thoughts, emotions and behaviours may serve to ultimately increase state stress and also physiological arousal during an experimental task.

Braud (1985) has often reflected on the possible relationship between PK effects and the sympathetic nervous system, stemming from the premise that PK effects may be facilitated by an increase in activation – as opposed to ESP, which may benefit from a decrease in activity. Braud cites the comparable suppressed physiological, emotional and stress responses in focal agent RSPK real-world occurrences and gifted individuals within

observed experiments. However, there is still insufficient information garnered from experimental studies to either support or nullify such a premise. Braud also warns that PK effects may not directly involve increased activity in the sympathetic nervous system, but act as a prior routine for ensuing behaviour.

Previously, Braud and Schlitz (1983) had conducted an experiment investigating so-called 'bio-PK' – whereby PK effects impact biological systems – and whether intention would act as a facilitator. Thirty-two participants were pre-selected on the basis that they considered themselves to have inordinate sympathetic nervous system arousal and presented high levels of emotionality, anxiety and stress. Arousal levels were measured using electrodermal activity (EDA) prior to the sessions to determine two participant categories – Active, who had high levels of EDA; Inactive, who had low levels of EDA. The researchers offered the assumption that those in the Active group would have greater need have a calming influence and those in the Inactive group would have a lower need. The hypothesis generated was that PK effects via an agent using a calming influence would be greater for those in the Active group than the Inactive. This hypothesis also took into account the higher levels of intention that the agent may have in trying to exert a calming influence on those in the Active group. The procedure involved the participants listened to computer-generated tones and watching a coloured light display, designed to occupy attention and stave off boredom. EDA was measured throughout the twenty minute session and the participants informed that the calming influence would occur during an undefined period. Meanwhile, the influencing agent was in another room and given random tonal signals to either 1) not think about calming the participant (control) and 2) to project a calming influence. It was hoped that evidence of calmer state would present in lowered EDA readings from the participants with the decreasing percentage acting as a measure for PK effects. Results showed that there was a significant difference between EDA scores, with the percentage of the Active group lower than the Inactive ($t(30) = 1.86, p = .035, 1-t$). To err on the side of caution, the researchers tested whether there would be a difference in EDA levels when participants were asked to calm themselves. Findings showed that there was a stronger effect for self-control ($t(15) = 6.16, p = 3.8 \times 10^{-1}$) than with the possible PK effects, but it was not significant. In conclusion, the researchers observed that the EDA effects may be caused by other explanations. The most interesting alternative in terms of this thesis is that PK effects occurred not on physiological processes but on the equipment producing the random influencing periods (the signalling tones), which are then altered to suit the individual participants physiological patterns of EDA increases and decreases. Such an alternative explanation is suggestive of PK effects occurring

via a lability interaction process between the random event generator and the influencing agent as suggested by Braud (1980). The researchers also state that they suspect that PK effects are more likely to occur during such bio-PK experiments on the most labile factor within the procedural chain, which they reflect should be the individual participant. However, with so little yet known about lability at this time, this presumption obviously does not take into account that individuals may also have differing levels of lability. Yet, within an experimental environment, it is not only innate individual differences that can impact outcomes. There are a variety of external factors that can mediate performance and subsequent findings which were defined by Orne (1962) as innate ‘demand characteristics’ of a psychology experiment:

...the totality of cues and mutual expectations which inhere in a social context...which serve to influence the behaviour and/or self-reported experience of the research receiver or patient (Orne & Whitehouse, 2000, p. 469).

These reactions by the participant to the setting may be unconscious or unconscious and so can significantly impact the machinations of the experiment, producing variable outcomes. A mainstay of such ‘demand characteristics’ are cues determined by the participant from either the experimenter or from the immediate experimental environment. The next section outlines such salient ‘demand characteristics’ believed to be of importance to parapsychological research and which will be explored in the following chapter detailing Experiment Two.

5.4. The Standardised Procedure for the Three Sequential PK-RNG Studies

5.4.1. Pilot Studies

Small pilot studies were conducted for each of the three PK-RNG studies ($n = 5$) in order to assess the suitability of the design and enable smooth use of the materials, measures and equipment. Participants were gained from the intended sample and performed the experiment under the same conditions as the actual sample groups. Due to the small sample size, no statistical analyses were performed. Following the first pilot experiment for Experiment One, it was noted that there were differences in how long participants took to complete the measures and the I Ching task. Therefore, the duration for completing the measures and the I Ching task was standardized which resulted in the final procedural timeline given for all of the experiments.

5.4.2. Aims and Hypotheses

Based on the theoretical framework that individual lability contributes to the production of PK-RNG effects it was predicted that levels of individual lability would interact with levels of RNG system lability. In line with the conformance behaviour models (see Section 3.3) of system lability it was intended to assess three levels of individual lability as being low, medium and high against three corresponding RNG system lability levels of Table, Pseudo and Live. In addition, due to the multifactorial structure of the developed Lability Scale, the interaction between the five identified dimensions and RNG system levels would also be explored.

The relationship between perceived subjective stress and individual lability using a comprehensive measure had not yet been explored. Yet, it was hypothesized that there would be a significant positive relationship between scores of these measures, reflecting the conceptual similarity of these processes.

In addition, the impact of gender on PK-RNG effects, and potential differences between males and females in individual lability scores and perceived subjective stress scores will be explored.

Therefore, the hypotheses for Experiment One are:

Hypothesis 1 – Overall, there would be a significant interaction effect between the levels of system lability of Table, Pseudo and Live with the individual lability levels of Low, Medium and High (3 x 3 mixed factorial ANOVA)

Hypothesis 2 – Perceived subjective stress scores will correlate highly with individual lability scores (Pearson/Spearman correlation, 2-tailed).

Hypothesis 3 – Perceived subjective stress scores will correlate significantly with individual lability subscales scores (Pearson/Spearman correlation)

Hypothesis 4 – There will be a difference between genders for perceived subjective stress scores (independent *t*-test)

Hypothesis 5 – There will be a difference between genders for individual lability subscale scores (independent *t*-test)

5.5. Method

5.5.1. Design

The dependent variable for analyses were the Q-sort ratings given by the participants prior to selection by the I Ching computer program for the three out of sixty-four I Ching divination hexagrams. Ratings for the 64 I Ching divinations ranged from between least 'appropriate or accurate' to 'most appropriate or accurate'. Possible PK effects were assessed by using the three RNG system lability sources of Table (low), Pseudo (medium) and Live (high). To illustrate, as the rating scale ranged from -7 (least appropriate or accurate) to +7 (most appropriate or accurate) an example of a prior rating could be Live (3); Pseudo (-7); Live (5).

All three studies used a 3 x 3 mixed factorial ANOVA to investigate the within subject variable of the I Ching divination ratings given by the three levels of system lability (Table, Pseudo, Live) and between subject variable of the levels of individual lability (Low, Medium, High). In addition, the three studies explored the relationships between the variables and the five factors of the LS using correlational analyses.

An additional independent variable was included of perceived subjective stress measured using scores from the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983).

5.5.2. Participants

Due to the sequential nature of the PK-RNG studies, the duration of each experiment was kept within a time-line of a four week period and to include participant recruitment for each experiment and conducting the experimental procedure. This would allow a period of time for the author to perform the analyses and write up the given experiment before the commencement of the following experiment. Separate sample groups were recruited for each of the three experiments. In an attempt to gain a diverse range in regards to age and beliefs, voluntary adult participants were actively recruited via local posters and flier advertising around the University of Northampton campus; by word of mouth; by specific written and email invitations to local inhabitants and to members of recognized parapsychological forums. The advertisements for the experiments stated that it was a parapsychological experiment, therefore it was noted that a number of participants openly expressed their interest and belief in parapsychological phenomena. According to Cohen (1988) the recommended group sample size for an estimated effect size of 1.0 standard deviation and .80 power for within subjects is

17 and for between subjects 34. Therefore, recruitment for each experiment was aimed at 50 participants which would fulfil these group sample power criteria.

Experiment One: The experiment proposed to recruit 50 participants, initially. However, an opportunity sample of 48 adults were eventually accrued from the general population during the required time-line. Due to incomplete data due to a technical fault with the original database, data from one participant was lost. Therefore, analyses were performed using $N = 47$ where 23 were male and 24 were female. The age ranged from 18 years to 71 years ($M = 38.84$, $SD = 14.43$).

5.5.3. *Materials and Apparatus*

Consent and debriefing forms were created by the author for the purpose of this research (see Appendix A.6 for copies of these forms). A Satellite Pro Laptop with a previously custom written I Ching RNG program written in QuickBasic v.1 which had been used effectively within previous studies, (Roe, Davey, & Stevens, 2004; Roe, Martin, & Drennan, 2010). The sixteen lines of the hexagram are determined by the participant figuratively ‘tossing three coins’. Outcomes are either a broken yin line ‘____ _’; a solid yang line ‘_____’ or a broken line version of both of these ‘____ _ ____ _’.

The hexagram is built from ascending lines beginning at the base. On completion of the hexagram the program displays the appropriate hexagram reading on the screen. The sequence is repeated three times by the individual pressing the space bar in order to use the three different RNG lability sources. These lability sources are as follows: Low lability, using a random Table condition. Originally, the RND function of a calculator had been used to determine the starting point of the table sequence and data was stored as values ranging from 0 to 255, mirroring the other RNG lability sources. Values > 128 were determined as ‘heads’ of the coins, with ‘tails’ being the remaining numbers < 128 . The data was considered in sets of three to equate with throwing the figurative coins, and the procedure repeated to generate the whole hexagram. A medium lability source was gained using a pseudorandom condition using the INT(RND) computer command and the subsequent values of 0 to 255 was generated in real-time during the task. High lability source used a true random number generator. True random data was obtained using a Portable Orion Random Number Generator (RNG) device, which utilises two independent Zener diode-based sources of noise which are converted into bit streams, combined and transferred to the computer in the form of bytes. During the I Ching procedure it was possible for the same hexagram to be repeated for more than one condition. The I Ching Q-sort rating table (A1 dimensions) with 64 individual hexagram

tablets was formatted following the design from previous studies. In accordance, the translations of the I Ching hexagram readings were adapted into single line sentences to provide simpler and easier descriptors. These condensed readings were created by Roe (Roe, Martin, & Drennan, 2010) from advice based on numerous published guides to interpreting the I Ching. The condensed readings retained the essence of the original readings in order to maintain the authenticity of the I Ching divination. The hexagrams were formatted onto tablets and laminated so that they would be sufficiently robust for repeated use during the I Ching task (See Appendix A.5, Figure 1.19 for examples).

In addition, the Q sort grid of A1 size was created and also laminated to form a fairly durable board with which to perform the rating task. It was decided to use colours to emphasize the difference between the ‘most appropriate’ rating side (green) and ‘least appropriate’ rating side (red) and with neutral colours for median ratings in the mid-section (See Appendix A.5, Figure 1.20)

5.5.4. Measures

The Lability Scale. A newly constructed 71-item measure with a Cronbach’s alpha of .86 and comprised of five factors exploring lability (the ease of change). The subscales of the LS to be explored further are: Intuitive Cognition, ($\alpha = .92$) which is concerned with transcendental mentation and a sense of ‘other’; Conceptual Cognition, ($\alpha = .42$) which is concerned with conceptualisation and an interest in creative pursuits; Ego-Orientated Cognition, ($\alpha = .78$) concerned with subjective emotional experiences and the self; Emotional Interpretation, ($\alpha = .71$) concerned with the understanding of emotional reactions; Analytical Cognition, ($\alpha = .79$) concerned with rational thought, (see section 4.1.14 for reliability data on the LS and subscales). This experiment represents the second use of the measure.

The Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, A global measure of perceived stress, 1983). A 10-item measure assessing an individual’s perceived stress levels which uses a 5-point Likert scale ranging from ‘0 = never’ to ‘4 = very often’ and has a possible range of scores from 0 to 40. The scale assesses the experience of stress in regards to how unpredictable, uncontrollable and overwhelmed individuals may be feeling throughout a preceding four week period. The initial 14-item scale had a high internal consistency gained from three independent samples with Cronbach’s alpha ranging from .84 to .86 (Cohen,

Kamarck, & Mermelstein, 1983). The commonly used 10-item scale also has a reported high internal reliability ($\alpha = .78$) (Cohen & Williamson, 1988); ($\alpha = .84$) (Polman, Borkoles, & Nicholls, 2010), (See Appendix A.9 for a copy of this scale). However, following use in this experiment the resulting Cronbach's alpha was very weak ($\alpha = .18$).

5.5.5. *Standardised Procedure*

Throughout the three PK-RNG experiments, aspects of the procedure were altered to suit the additional variable included. However, the key elements of the procedural process involving the relaxation period and performance of the I Ching task remained constant. The experimental sessions did not take longer than 20 minutes, excluding introductory and debriefing phases and were conducted within a laboratory environment in order to minimize external distractions. During the procedure the researcher was available to answer any immediate concerns of the participants regarding the experimental sessions. Participants were required to read and sign a preliminary consent form which outlined the nature of the experiment as exploring the relationship between individual liability and I Ching predictions. Participants were not informed that the experiment was also specifically exploring possible PK effects as such pre-emptive knowledge may have impacted on the results⁴. The consent form emphasizes any ethical issues including the right to withdraw at any time without having to give any reasons for doing so; avoidance of psychological and physical harm to the participants; keeping the confidentiality of the participants' personal details; a debriefing following the actual experimental session (copies of the consent and the debriefing form are in Appendix A.6). Participants were given the newly constructed Liability Scale (see Appendix A.8 for a copy), and any additional scales relevant to the particular experiment and asked to complete these measures within a 10 minute period. Participants were then informed that they would have a period of 3 minutes in which to relax and think of a question to ask the I Ching oracle. The researcher stressed that at no point should the participant discuss the nature of the question with them or to even verbalise their intention. Following this period of relaxation, the participants were asked to complete the rating of the I Ching task using the given Q-sort table provided and were informed that they had a time limit of 10 minutes in which to do so. Once this task was completed, they were then asked to perform the casting of 3 hexagrams on the computer generated I Ching program. On completion of this task the participant was informed that the experimental session was at an end. Participants were then

⁴ However, for the third experiment, where active striving was explored as an additional factor, after the 'practice' I Ching procedure participants were asked to try and affect the outcome, although no mention of actual PK effects was included.

debriefed verbally and informed of the actual nature of the experiment in regards to exploring possible PK effects and invited to ask the primary research any queries or concerns. An accompanying debriefing form was then given to participants to take with them, which included the primary researcher's and project Supervisor's contact details.

Alongside the newly constructed Liability Scale participants were asked to complete the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) at the beginning of the experiment.

5.5.6. Ethical Considerations

Due to the experiment being conducted within the Centre for the Study of Anomalous Psychological Processes within the University of Northampton the specific directives concerning the institutions own ethical guidelines and Code of Conduct was strictly adhered to. In addition, the following considerations have been stipulated specifically in accordance with the British Psychological Society's (2009) mandates regarding Standards of general respect (Guideline 1.1); of privacy and confidentiality (Guideline 1.2); of informed consent and the use of deception (Guideline 1.3); of self-determination (Guideline 1.4); of general responsibility (Guideline 3.1); of protection (Guideline 3.3); and debriefing of research participants (Guideline 3.4).

Participants were reassured that confidentiality would be maintained. Their personal details would be protected by the researcher using a substitute code during the recording of raw data and in composing the final experiment conclusions as it is hoped that subsequent findings would be disseminated to the public. In order to meet informed consent requirements, before commencement of the experiment, individual participants were required to read a preliminary consent form outlining the nature of the project and to verbally acknowledge their understanding of the procedure and willingness to proceed. Due to the nature of the experiment exploring the parapsychological phenomenon of psychokinesis (PK), it was deemed appropriate to employ an element of deception within the experimental procedure, whereby adhering to Guideline 3.1, section xii (c) – 'the nature of the deception is disclosed (to clients) at the earliest feasible opportunity'. Therefore, the aim of the experiment involving PK is revealed within the subsequent debriefing. Participants were notified (both within the consent form and reiterated verbally by the researcher) at the beginning of the experiment of their right to withdraw from the experiment at any time and without having to provide a reason for doing so. In the event, any collated individual data would subsequently be destroyed and not included within the final analyses. Furthermore, as the interpretation of

the I Ching divination is subjective for each individual and the questions posed may include particularly sensitive issues, the investigator reiterated that the participants' personal questions should not be shared with them and would also not comment on any I Ching divination outcomes. To ensure data protection was upheld, all raw physical data and reports from the experiment are maintained in a secure location by the researcher. This includes the use of a password protected computer program and secure files under lock and key for any paper records, accessible only by the researcher. With the potential for publishing conclusions, all research records will be retained for a minimum of five years following completion of the project and then subsequently destroyed. On completion of the experiment each participant was debriefed verbally as to the actual research hypotheses additionally exploring PK effects and made aware of the element of deception involved within the procedure and subsequently invited to ask the investigator any related questions. The researcher was prepared with appropriate professional referrals to offer if any concerns regarding the subject matter are raised. A supplemental written debriefing form was also provided, which supplied contact details of the primary researcher and a senior academic supervisor. To err on the side of caution, there was also a very slight possibility that individuals may set too much emphasis on the I Ching predictions in relation to their personal question. Although, as can be seen in the hexagram examples shown in Figure 6.1, the statements were very general in nature.

5.6. Results

The raw data was inspected for missing cases, outliers and assumptions of normality using descriptive analysis (see Section 4.9.1. for an overview) before subsequent inferential analysis was performed.

Table 5.1 shows the means, confidence intervals, skewness and kurtosis for the within subject variables of Q-sort hexagram ratings for levels of RNG lability and between subject variables of individual lability and perceived stress scores.

Table 5.1 *Descriptive statistics for Q-sort hexagram ratings levels of RNG system lability (Table, Pseudo, Live), Perceived Stress Scale (PSS), Lability Scale (LS)*

<u>Variable</u>	<u>Mean</u> <u>(SD)</u>	<u>95% CI</u> <u>Lower</u>	<u>95% CI</u> <u>Upper</u>	<u>Skewness</u> <u>(SE)</u>	<u>Kurtosis</u> <u>(SE)</u>
Table rating	-.62 (3.44)	-1.63	.39	.18 (.35)	-.70 (.68)
Pseudo rating	-.28 (3.58)	-1.33	.77	.41 (.35)	-.51 (.68)

Live rating	-.58 (2.84)	-1.41	.26	-.03 (.35)	-.46 (.68)
PSS	23.49 (2.67)	22.71	24.27	.98 (.35)	.96 (.68)
LS	187.36 (17.74)	182.15	192.57	-.38 (.35)	.32 (.68)

Note: $N = 47$

If the divination chosen by the computer program was determined by chance alone, the mean scores presented would hover around 0. However, as can be seen in Table 6.1 mean scores for each of the RNG lability levels are all negative, meaning that on average the scores are less applicable. Overall, the lowest average was found in ratings from the Table RNG lability source followed by Live and with the highest average being ratings from Pseudo. These findings indicate that participants rated the I Ching divinations produced by the Table RNG lability source as being less applicable in general than those from the Pseudo and Live RNG lability sources.

Means and standard deviations for the hexagram ratings for Q-sort hexagram ratings for levels of RNG lability (Table, Pseudo, Live) and levels of individual lability (Low, Medium, High) are shown in Table 5.2.

Table 5.2 Means and standard deviations (SD) for Q-sort hexagram ratings for Q-sort hexagram ratings for levels of RNG lability Table (Low), Pseudo (Medium), Live (High) and individual lability (Low, Medium, High)

RNG lability	Individual lability levels			
	Low	Medium	High	Total
Table	-.75	-1.25	.21	-.62
(SD)	(3.69)	(3.40)	(3.44)	(3.44)
Pseudo	1.5	.00	-1.0	-.28
(SD)	(5.80)	(3.78)	(2.75)	(3.58)
Live	-.50	-.67	-.47	-.58
(SD)	(4.43)	(2.44)	(3.12)	(2.84)
Average	0.08	-0.64	-1.26	-1.47
(SD)	(4.64)	(3.21)	(3.10)	(9.86)
N	4	24	19	47

As can be seen in Table 5.2 the lowest overall average rating was gained by the high individual lability group. There is a slight increase in average scores moving to the medium lability group and through to the low individual lability group. When these slight differences are tested using a one sample t-test against the null value of zero the differences are not significant, Table RNG ($M = -.62$, $SD = 3.44$), $t(46) = -1.23$, $p = .23$, $d = -.04$; Pseudo RNG (M

= -.28, $SD = 3.58$), $t(46) = -.53$, $p = .60$, $d = -0.16$; Live RNG ($M = -.57$, $SD = 2.84$), $t(46) = -1.39$, $p = .17$, $d = -0.41$.

However, this initial trend mirrors the predicted interaction between low lability in one system interacting with high levels in another system.

5.6.1. Restatement of hypotheses

Hypothesis 1 – Overall, there would be a significant interaction effect between the levels of system lability of Table, Pseudo and Live with the individual lability levels of Low, Medium and High (3 x 3 mixed factorial ANOVA).

An initial Mauchley's test showed that the assumption of sphericity was not violated, $\chi^2(2) = 3.54$, $p = .17$. A mixed 3 x 3 ANOVA was performed with the dependent variable being the ratings of the I Ching divinations from the RNG lability sources (Table, Pseudo, High). A prior Levene's test showed that assumptions of variances were assumed ($p > .05$). The independent variable was the level of individual lability (Low, Medium, High). There were no significant main effects of the degree of RNG lability, $F(2, 88) = .44$, $p = .65$, partial $\eta^2 = .01$; nor of individual lability, $F(2, 44) = .26$, $p = .77$, partial $\eta^2 = .02$. The interaction between individual lability levels and RNG lability levels was not significant $F(4, 88) = 0.95$, $p = .44$, partial $\eta^2 = .04$ (Figure 5.1). Therefore, the findings fail to support the prior primary hypothesis.

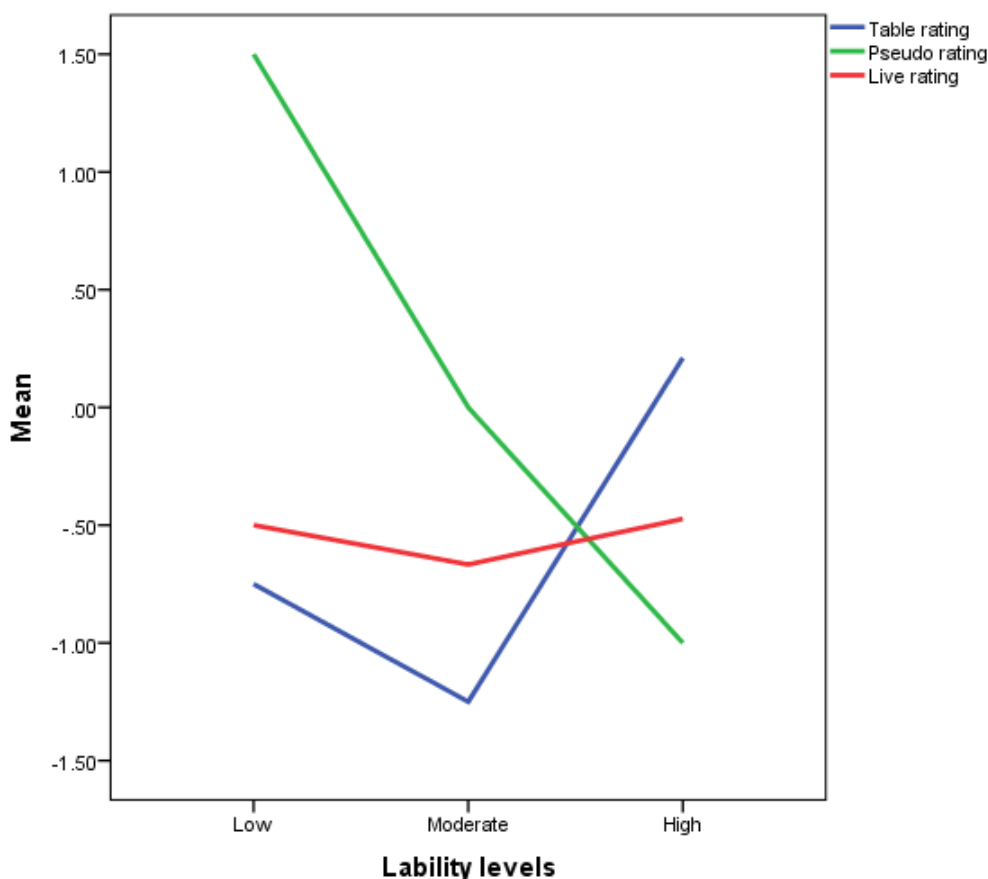


Figure 5.1 Multiple line graph showing the interaction between Q-sort hexagram ratings for levels of RNG liability (Table, Pseudo, Live) and levels of individual liability (Low, Medium, High)

Hypothesis 2 – Overall perceived stress will correlate highly with individual liability (Pearson correlation, 2-tailed).

As can be seen in Table 5.3 there is no significant relationship between scores of individual liability on the LS and scores of perceived stress from the PSS. Therefore, the secondary hypothesis is not supported. However there is a significant negative correlation between scores from the PSS and Live RNG system. This shows that as scores on the PSS decreased ratings from the Live RNG system increased.

Table 5.3 Correlation matrix for Perceived Stress Scale (PSS) mean total score, ratings of the three RNG liability sources (Table, Pseudo, Live), and the Liability Scale (LS) mean total score

<u>Variable</u>	<u>PSS</u>	<u>Table RNG</u>	<u>Pseudo RNG</u>	<u>Live RNG</u>	<u>LS</u>
PSS	—				
Table RNG	-.18	—			
Pseudo RNG	.06	-.14	—		
Live RNG	-.29*	-.04	.20	—	
LS	.21	.13	-.16	-.05	—

Note: ** $p < .01$ level (2-t); * $p < .05$ level (2-t); $N = 47$

Gender

Hypothesis 4 – There will be a difference between genders for perceived subjective stress scores (independent t -test)

A prior Levene's test showed that equal variances were assumed. An independent t -test was performed to gauge the difference between the genders in relation to perceived subjective stress. Results showed that there was no significant difference between males and females, $t(45) = -1.35$, $p > .05$, $d = -.40$.

Hypothesis 5 – There will be a difference between genders for individual lability scores (independent t -test)

However, the average total lability scores for males ($M = 180.52$, $SD = 17.75$) and females ($M = 193.91$, $SD = 10.38$) were examined using an independent samples t -test. A prior Levene's test revealed no violations of normality or homogeneity of variance and so equal variances were assumed and showed a significant mean difference with a large effect size, $t(45) = -2.77$, $p < .05$, $d = .83$. Independent t -tests were performed to explore the differences between the genders and the five individual lability factors. Results showed that there were significant differences between males and females with large effect sizes for IC, $t(45) = -2.67$, $p < .05$, $d = -.80$ and EGO, $t(45) = -2.52$, $p < .05$, $d = -.75$. There were no significant differences between males and females for CC, $t(45) = .19$, $p > .05$, $d = .06$; EI, $t(45) = -1.37$, $p > .05$, $d = .41$; AC, $t(45) = 1.34$, $p > .05$, $d = .40$.

On average, males have lower lability scores, commensurate with previous results gained from the survey discussed in Chapter Three as shown in Figure 5.1.

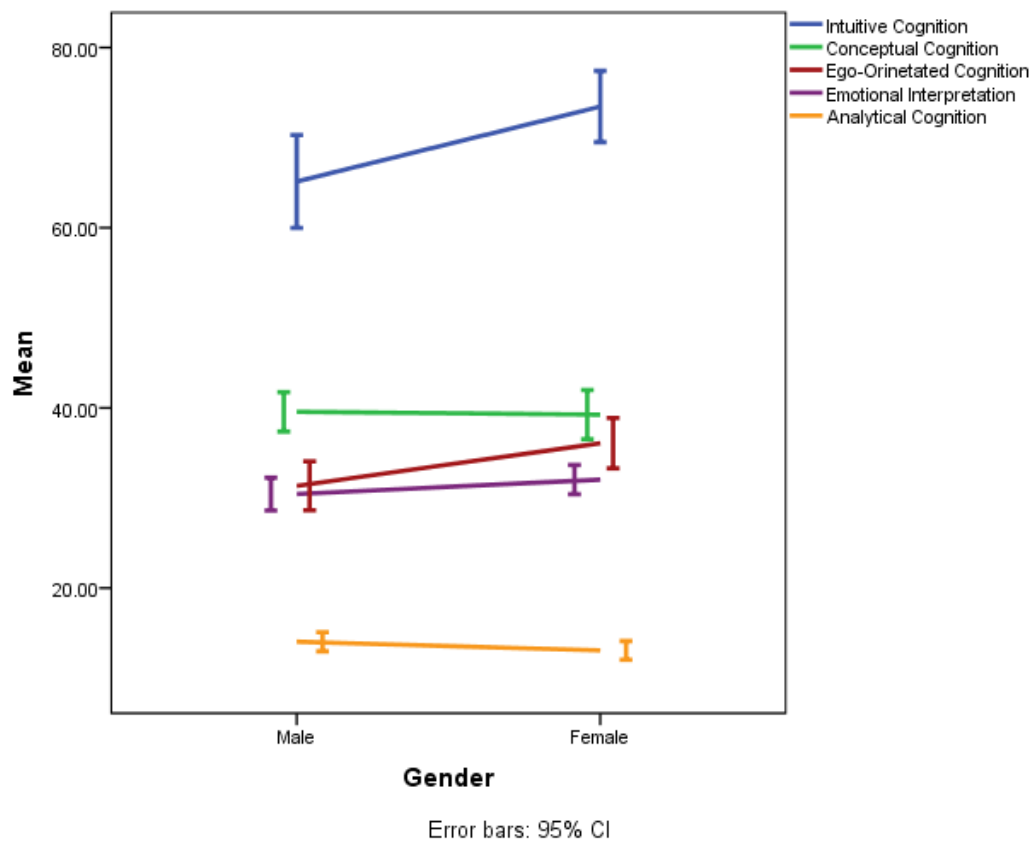


Figure 5.1 Multiple line graph with 95% confidence intervals showing the difference between the genders in relation to the five liability subscales

A mixed analysis of variance analysis was performed in order to gauge the effects of gender (male, female) and individual liability levels (low, medium, high) on RNG liability (Table, Pseudo, Live). There was no significant main effect for individual liability $F(2, 41) = .68, p = .512, \text{partial } \eta^2 = .017$). There was no significant main effect for the effect of gender on RNG liability $F(2, 41) = 1.44, p = .242, \text{partial } \eta^2 = .034$). There was no significant interaction effect for RNG liability and gender $F(2, 82) = 1.93, p = .152, \text{partial } \eta^2 = .045$). There was no significant interaction effect for RNG liability, individual liability and gender $F(4, 82) = 2.07, p = .093, \text{partial } \eta^2 = .092$).

The five factors

Correlations were performed using the five factors as separate variables and the variables of Perceived Stress and RNG liability ratings as shown in Table 5.4.

Table 5.4 Correlation matrix of perceived stress (PSS), the five factors identified within the Liability Scale of Intuitive Cognition (IC), Conceptual Cognition (CC), Ego-Orientated

Cognition (EGO), Emotional Interpretation (EI), Analytical Cognition (AC) and participant ratings of the three RNG sources (Table, Pseudo, Live)

Variable	PSS	Table (Low) RNG	Pseudo (Medium) RNG	Live (High) RNG
PSS	—			
Table (Low) RNG	-.180	—		
Pseudo (Medium) RNG	.060	-.143	—	
Live (High) RNG	-.289*	-.039	.198	—
Factor 1 Intuitive Cognition	.105	.056	-.148	-.021
Factor 2 Conceptual Cognition	-.049	.159	-.011	-.145
Factor 3 Ego-Orientated Cognition	.409**	.112	-.095	-.081
Factor 4 Emotional Interpretation	.095	-.023	-.040	.004
Factor 5 Analytical Cognition	-.183	-.002	-.105	.303*

Note: ** $p < .01$ level (2-t); * $p < .05$ level (2-t); $N = 47$

As can be seen in Table 5.4, there is a moderate positive relationship between PSS and EGO ($r = .41, p < .01$) suggesting that as perceived stress levels increase so do levels of Ego-Orientated Cognition. There is a further moderate relationship between participant ratings from the Live (high) RNG lability source and AC ($r = .30, p < .05$), showing that as participant ratings from this source increase, so do levels of Analytical Cognition. Strong significant positive intercorrelations can be seen between EGO and IC ($r = .55, p < .01$) and EI ($r = .60, p < .01$).

5.6.2. Summary of Results

Exploratory statistics. Overall, ratings for the I Ching divinations were negative. This indicates that in general, participants gave ratings for the divinations which were less appropriate to their posed question. On average, ratings were lowest for divinations produced by the Table RNG lability source. However, individuals scoring high lability levels gave the highest ratings for divinations provided by the Table RNG lability source and although the

differences between the individual lability groups was not significant, this trend does mirror the desired for interaction prediction.

Individual lability and RNG lability interaction. This thesis introduced the possibility that PK-RNG effects in a laboratory environment could be produced. Therefore, the primary hypothesis for all three empirical studies - that PK effects could be demonstrated within the conformance behaviour models (CBM) of Stanford (1978) and Braud (1980) via the interaction between levels of individual lability and Q-sort hexagram ratings for levels of RNG lability sources – was tested. However, the findings from Experiment One failed to find significance in the main effects of RNG lability source, individual lability level or in the interaction between levels of individual lability (Low, Medium, High) and RNG lability sources (Table, Pseudo, Live) and so could not support this primary hypothesis.

Relationship between perceived stress and individual lability. The secondary hypothesis for Experiment One proposed that there would be a relationship between perceived stress and individual lability. However, there was no significant relationships between scores on the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) and the Lability Scale. Interestingly, there was a significant positive relationship between perceived stress and the Live RNG lability source. This shows that as perceived stress levels increase ratings for the I Ching divinations from the Live RNG lability source decrease or are deemed less appropriate to the participants' posed question. In reiterating Isaacs (1989), the unconscious stress within either the participants' or the researchers personal lives which necessarily accompany the individual into the experimental situation and unduly cause an impact on outcome.

Gender. There were significant differences found between males and females in relation to individual lability scores and in particular, the two factors of Intuitive Cognition and Ego-Orientated Cognition. This finding goes some way to support the proposition of Jawer (2006) in relation to the neurobiological differences between the genders, with females being distinguished as more 'sensitive', of which inherent lability may be a contributing factor.

5.7. Discussion

The primary aim within this study focuses on the possibility that PK effects stem from interaction between RNG and individual lability. Based on the foundational theories of Stanford (1978) and Braud (1981) previous research had found significant PK outcomes from the interaction between low levels of RNG lability and high levels of individual lability and

vice versa (Levi, 1979; Morris, Nanko, & Phillips, 1978; Holt & Roe, 2006). This association had held true when exploring the results from the survey (see Chapter 4) where there was a significant interaction both between individual lability as assessed by the Lability Scale and scores of Anomalous Experience and Psychokinetic Experience. Therefore the initial analysis maintained this first aim by exploring the interaction between levels of individual lability (Low, Medium, High) and RNG lability (Table, Pseudo, Live). However, the findings have not shown significance, $F(4, 88) = .95, p = .439, \eta^2 = .04$, in contrast to results from previous studies (Holt & Roe, 2006; Roe & Holt, 2006; Roe, Martin, & Drennan, 2010). Thus, the hypothesis that there would be a significant interaction between opposing levels of individual and RNG lability was not supported. Given these findings consideration must be given as to why significance was not achieved. The present study aimed to create PK conducive experimental conditions, consisting of an engaging PK task that had some personal meaning to the participants. In accordance with previous research using a computer based divinatory reading (Roe, 1996; Storm, 1998; Storm & Thalbourne, 2001a; 2001b), the use of the I Ching program was deemed entirely appropriate. However, it may be that the sample of participants within the present study did not hold such divinatory readings as meaningful and therefore did not become suitably engaged enough to generate significant lability interactions with the RNG. On reflection, perhaps by preselecting participants from those who believe in psi, have had previous PK experience or believe that they possess psi abilities – may be of more benefit in anticipating significant PK effects in accordance with the work of von Lucadou and colleagues (von Lucadou, 1987) (von Lucadou, Lay, & Kunzmann, 1987). However, the present study builds on the premise proposed by Braude (1979; 2002) that PK processes are latent within all persons rather than the selected few and may be triggered unconsciously within certain conditions. Expressing prior beliefs and experiences has not necessarily equated with reliable experimental PK effects. Controversially, the number of variables considered within the study design may have themselves created too much ‘noise’ within the data to be able to observe the perhaps more subtle PK effects produced from lability interaction, arguing a case for ‘less is more’ in experimental PK-RNG studies.

The relationship between perceived subjective stress and individual lability was explored using correlational analysis in accordance with the second aim to explore the relationship between individual lability and perceived stress. With this in mind, it was found that the second hypothesis that there would be a significant relationship between score on the Lability Scale and the Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, 1983) was not supported.

The purposeful nature of the time restriction given to the Q-sort rating and the persistent verbal reminder by the researcher as to the time taken and the time amount left in which to complete the rating may have been sufficient in causing an increase in unconscious physiological arousal. Characteristics of such increases would not only mean an increase in heart rate, but in respiration, sweat production, gastric processes and loss of concentration and coordination of movements (Totman, 1990). This lack of self-regulation is enough for an individual to experience moderate levels of stress for a relative short period of time but which is not enough to be harmful to overall health (Rosenbaum, 1988). As hypothesised by Roll (1983; 2007) in instances of PK activity, rather than an individual experiencing an acute instance of severe stress, it is more likely that a moderate ongoing state of stress, arousal or anxiety is sufficient to act as catalyst for the production of PK effects. However, without a method to determine that there were physiological arousal differences between the two experimental states of relaxation and performing the I Ching task the state of the participants remain inconclusive.

In addition, as suggested by Dunne (1998) it was worthwhile to explore possible differences between the genders during this study and it was subsequently found that there was a significant difference between males and females in regards to levels of lability. On average, males were more likely to have low levels of lability compared to females. This result is interesting in relation to coping strategies to combat stress employed by the different sexes. It has been found that males in general prefer problem-focused coping strategies and take a more active role in managing stress (either conscious or unconsciously) which tend to be successful; whereas females are known to rely more on emotion-focused techniques which are less successful in managing stress (Baker & Berenbau, 2007; Howerton & Van Gundy, 2009). However, from the outset it seemed that hypothesis five remained unsupported as there were no significant interactions between gender, individual lability and RNG lability. However, there was a significant difference between males and females and Lability Scale scores. In addition, there was a significant difference between the genders for Intuitive Cognition and Ego-Orientated Cognition factors.

Since lability has been defined as the ease of fluctuation in various individual difference processes, it could be assumed that females being comfortable with emotion-based strategies would have high levels of lability and that conversely, males being less reliant on emotive-based techniques and more so on relatively rigid problem-focused techniques have lower levels of lability. On a positive slant there is scope to explore this observed trend in the further sequential experimental studies.

However, there was not a significant difference between perceived stress levels for males and females. This result is suggestive that rather than each gender deemed as experiencing either more or less stress, that their perceived view of subjective stress is similar. As the understanding of the nature of stress has become commonplace in modern society, it is more likely that individuals are more aware of such 'everyday' stressors and in doing so are becoming desensitized to the impact. These findings support the research of Almeida and Kessler (1998) who found when investigating subjective stress and anxiety in males and females, that there were no significant differences found once everyday stress was taken into account.

Furthermore, there was no significant difference found between males and females for PK effects. This finding unfortunately adds to the theoretical mist surrounding the impact of gender on PK effects. PK-RNG studies conducted by the PEAR laboratory (see Chapter Two) concluded that gender should be considered as an important factor in relation to PK effects (Dunne, 1998). Roll (1977) found that the majority of PK agents identified in anecdotal reports were female with a median age of fourteen years. However, there were earlier macro-PK studies by Roll involving a young male who had been reported as being the possible agent of PK activity, who had also shown negative personality and behavioural traits (Roll, 1969). It may be that females are more likely to report such instances or be more amenable to participate in experimental studies, whereas, it is known that males are rather reticent in reporting instances of paranormal phenomena or even a belief in such (Kennedy, 2005).

Finally, the five factors previously identified within the Lability Scale were assessed in relation to the other variables. A strong positive correlation was found to be between Factor 3 Ego-Orientated Cognition and Perceived Subjective Stress scores, ($r = .41$, $p < .01$), showing that as levels of PSS increased, so did levels of that lability factor. This finding is interesting due to the nature of the lability dimension concerning the self and how the individual perceives their own relationship with their internal and external world. Hence, it may be that stress responses are associated with lability in certain domains, such as the awareness of self within psychological spaces as elicited by Braud (1980) within his model of conformance between lability and inertia, rather than with ability across all domains. There is also a moderate positive correlation between Factor 5 Analytical Cognition and ratings from the Live RNG lability. With this dimension concerned with using logic and concerned with rational thinking relating to the most labile of RNG sources is suggestive of the interactions between lability levels of opposing systems found in previous research. Rather confusingly, it opens the question as to whether it is individuals having higher levels of this aspect of lability

which enables the interaction with more random systems. In addition there were further positive significant intercorrelations seen between Factor 1 Intuitive Cognition and Factor 3 Ego-Orientated Cognition ($r = .55, p < .01$). Intuitive Cognition relates to transcendental mentation and a sense of 'other, whilst Ego-Orientated Cognition is concerned with the interpretation of subjective experiences. There was an intercorrelation between Factor 3 Ego-Orientated Cognition and Factor 4 Emotional Interpretation ($r = .60, p < .01$). Emotional Interpretation is characterised by an understanding of one's emotional reactions. These findings are suggestive of the comments made by the allegedly 'gifted' Matthew Manning (1982) who stated that to produce directional PK effects he needed a sense of calmness and of being at one with the universe. There were no intercorrelations concerning Factor 2 Conceptual Cognition, characterised as being concerned with conceptualisation and having an interest in creative pursuits and Factor 5 Analytical Cognition, pertaining to rational thought. It may be that the intercorrelating dimensions, which are primarily concerned with internalization, the subjective self and emotions compared to Factors 2 and 5 which are more concerned with externalized aspects, are more pertinent to understanding the nature of lability as a construct. Further research is required to explore this.

It is disappointing that the results from this study did not echo the consistently replicated interactions found within the previous research (Holt & Roe, 2006; Roe & Holt, 2006). In an attempt to understand these findings it is necessary to address identified problems which may have affected the outcome unduly.

5.7.1. Identified considerations within the methodology

In conducting the series of empirical PK-RNG studies a number of issues were identified which might serve to improve the methodology further in future research. Overall, it would have been useful to include prior questions as to levels of paranormal belief. An important line of research in this area has been from Schmeidler (Schmeidler & McConnell, 1958; 1977) who first coined the terms 'sheep' and 'goats' for individuals in references to levels of belief in paranormal phenomena following studies exploring aspects of both ESP and PK. Although the previous research by Rubin and Honorton (1971) using the I Ching as the experimental task was primarily investigating ESP, (see Section 5.1.4), participants had to rate the relevancy of either a randomly chosen or correct divination to a personal question. The findings showed that 'sheep' had scored significantly higher than 'goats', ($t = 2.22, p < .05$). However, the later experiment by Thalbourne et al. (1992-1993) attempted a replication with a slightly different sample size, but found no further significance ($t = .38$). This certainty

of belief in the existence of psi and subsequent performance effects has been observed to have a very strong relationship in previous studies, even in the misinterpretation of paranormal explanations when presented with deliberate pseudo-psychic deception (Wiseman, 1991). Heath (2003) offers the opinion that apparent PK effects on labile systems by individuals stem from an inherent belief that to influence such already kinetic systems is easier than an attempt on an obviously static system or immobile object. Thus, in determining the level of participants belief in paranormal phenomena prior to the experimental session and having participants be aware of the aims may be more likely to produce significant PK effects. In addition, it would be worthwhile to include a brief 'yes or no' question post sessions as to whether the participant believed that they had performed well during the task and achieved PK effects.

In considering the relationship between stress and arousal with PK effects Experiment One would have benefited further from including a specific stress-inducing task intended to increase arousal moderately in the participants. Such a task would have generated an observable amount of arousal and feelings of subjective stress rather than rely on the more subtle cue of having the participants perform the I Ching task under a time limit and verbal prompting.

CHAPTER SIX

PARTICIPANT-RESEARCHER INTERACTION: EXPERIMENT TWO

6. Introduction

This chapter will consist of an empirical study exploring the relationship between lability, psychokinesis (PK) and the interaction between the participants and the researcher during the experimental session. The following literature review will outline the theoretical and previous research issues that form a rationale for the proposed relationships. The primary aim was to build on the standardized format of the sequential empirical study with the inclusion of a new factor that may inform on the nature of how and when PK is manifested within an experimental environment. By assessing the interaction between the participants and the researcher during the experimental session it was hoped to investigate the influence of personal relations during this singular experience via the subjective perceptions of both the participants and the researcher. Although this experimenter effect was identified even within the early studies performed by Rhine and Pratt in the 1950s, research into this effect specifically within parapsychological studies by Kennedy and Taddonio (1976) suggested that the influence of the experimenter as an individual within the environment should not be overlooked when considering extraneous influences on experimental findings. Such influences are believed to have both negative and positive connotations. As such, positive perception by the participant in relation to the researcher has shown that the subsequent outcome of the experiment is likely to produce significant results. Conversely, if participants perceive either a negative or aloof attitude from the researcher, these are more likely to correlate with non-significant results. Evidence corroborating these previous theories has been further offered more recently by the studies involving self-confessed sceptical and non-sceptical researchers (Roe, Davey, & Stevens, 2006; Schlitz, Wiseman, Watt, & Radin, 2006). In relation specifically to parapsychological research, the attitudes of such researchers were further qualified as being either ‘psi conducive’ – consistently garnering significant results), or psi inhibitors (non-significant results), (Smith, 2003).

Employing short measures specifically addressing the perception of both researcher and participant, the research sought to better delineate the subjective states involved within the experimental PK-RNG environment. In addition, the perceived stress state of the individual participant would continue to be assessed using in order to explore how such subjective ratings relate to both the physiological reactions gained from monitoring heart rate, lability, the perception of the interaction with the researcher and PK outcome. Furthermore, the social

context of the interaction between the persons involved with the experimental setting will also be considered – the participant and the researcher.

The present study builds on the initial premise that external social factors necessarily impact on the subsequent performance by participants as what were phrased originally by Orne (1962) as innate ‘demand characteristics’ of a psychology experiment. These were later fully defined by Orne as “the totality of cues and mutual expectations which inhere in a social context...which serve to influence the behaviour and/or self-reported experience of the research receiver or patient” (Orne & Whitehouse, 2000, p. 469). These reactions by the participant to the setting may be unconscious or unconscious and so can significantly impact the machinations of the experiment, producing variable outcomes. A mainstay of such ‘demand characteristics’ are cues determined by the participant from either the experimenter or from the immediate experimental environment. The impact of the communication between participants and researchers within the ‘routine business’ of an experiment in parapsychology specifically was brought to the forefront by Wooffitt (2007). Verbal communication within parapsychological experimental settings is a vital tool for providing information and introducing participants to a field which may not be well-known. As Schmeidler (1997) also identified when researching psi-conducive and psi-permissive experimenters, it is not only verbal communication that acts as a facilitator between researchers and participants, but also the non-verbal cues such as body language and tone of voice. Schmeidler (1988) had earlier proposed that the majority of experimenter effects were probably too subtle for the individual participants and experimenters to be aware of them. However, she stated that there were two known experimenter variables identified as impacting on the research outcome – that of warmth and expectation.

Previous parapsychology research has touched upon how the interpersonal relationship between researchers and participants may be directly influencing the production of psi phenomena – but again, mainly in regards to ESP rather than PK. Examples of such includes an ESP study conducted by Honorton, Ramsey and Cabibbo (1975) which employed two experimental conditions of ‘formal’ and ‘friendly’ within the design. Out of the thirty-six participants, eighteen were exposed to the researcher chatting to them in a friendly manner before and during the actual procedure. The eighteen participants were subjected to the researcher approaching them with a deliberately cold and abrupt demeanour throughout the procedure. Results showed that scores were significantly higher within the informal condition compared to the formal condition, which were actually below chance expectation. A further study dually exploring experimenter effects and participants’ expectancy, judged by prior

belief in ESP, was undertaken by Taddonio (1975) which found that scores were higher for participants with positive expectancy in a successful outcome.

6.1.1. Aims and Hypotheses

Based on the theoretical framework that individual lability contributes to the production of PK-RNG effects it was predicted that levels of individual lability would interact with levels of RNG system lability. In line with the conformance behaviour models (see Section 3.3) of system lability it was intended to assess three levels of individual lability as being low, medium and high against three corresponding RNG system lability levels of Table, Pseudo and Live. In addition, due to the multifactorial structure of the developed Lability Scale, the interaction between the five identified dimensions and RNG system levels would also be explored.

The contribution of the relationship between the participants and the researcher and individual lability using a comprehensive measure had not yet been explored. Yet, it was hypothesized that there would be a significant positive relationship between scores of these measures, reflecting the theoretical underpinnings of optimal conditions for experimental PK effects to occur.

In addition, the impact of gender on PK-RNG effects, and potential differences between males and females in individual lability scores will be explored.

Therefore, the hypotheses for Experiment Two are:

Hypothesis 1 – Overall, there would be a significant interaction effect between the levels of system lability of Table, Pseudo and Live with the individual lability levels of Low, Medium and High (3 x 3 mixed factorial ANOVA)

Hypothesis 2 – Participants' interaction scores will correlate positively with the researcher's interaction scores (Pearson/Spearman correlation, 2-tailed).

Hypothesis 3 – Participants' interaction scores will correlate positively with individual lability scores (Pearson/Spearman correlation)

Hypothesis 4 – Participants' interaction scores will correlate highly with RNG lability system ratings (Pearson/Spearman correlation)

Hypothesis 5 - There will be a difference between genders for individual lability scores (independent *t*-test)

6.2. Method

6.2.1. Design

The dependent variable for analyses were the Q-sort ratings given by the participants prior to selection by the I Ching computer program for the three out of sixty-four I Ching divination hexagrams. Ratings for the 64 I Ching divinations ranged from between least 'appropriate or accurate' to 'most appropriate or accurate'. Possible PK effects were assessed by using the three RNG system lability sources of Table (low), Pseudo (medium) and Live (high). To illustrate, as the rating scale ranged from -7 (least appropriate or accurate) to +7 (most appropriate or accurate) an example of a prior rating could be Live (3); Pseudo (-7); Live (5).

All three studies used a 3 x 3 mixed factorial ANOVA to investigate the within subject variable of the I Ching divination ratings given by the three levels of system lability (Table, Pseudo, Live) and between subject variable of the levels of individual lability (Low, Medium, High). In addition, the three studies explored the relationships between the variables and the five factors of the LS using correlational analyses.

Additional independent variables of the perception of interaction between the researcher and participant was included using scores from the *Experiment/Experimenter Attitudes Rating Scale (EARS)* (Nichols & Maner, 2008) and from an Interaction Questionnaire (Sherwood, Roe, Holt, & Wilson, 2005).

6.2.2. Participants

The experiment used an opportunity sample of adults recruited from the general population, colleagues, friends and relatives with $N = 50$ where 26 (52%) were male and 24 (48%) were female. The age ranged from 16 years to 74 years ($M = 36.26$, $SD = 16.24$).

6.2.3. Measures

The Lability Scale a 71-item measure ($\alpha = .86$) developed in the initial survey-based study described in Chapter four was employed to assess individual lability. It includes aspects of cognition, neurological processes and emotion and assesses the ease of how these various aspects fluctuate subconsciously within an individual.

Furthermore, there were two short separate measures to be completed by the participant and researcher. These were used to assess the subjective perception of the experimental session and the personal interaction between the participant and the researcher.

Interaction Questionnaire. This 7-item scale initially developed for use in previous studies (Sherwood, Roe, Holt, & Wilson, 2005) as a tool with which to assess the nature of experimental psi sessions originally from the participants' perception. For this experiment the items have been adapted to gain information on the researcher's subjective experience using ratings on 7-point scales. The Cronbach's alpha for this scale following use in this experiment was strong, ($\alpha = .95$).

1. How would rate your current mood? (Negative – Positive)
2. How do you feel at this moment? (Relaxed – Tense)
3. How would you rate the experimenter/participant interaction in terms of warmth (Negative – Positive)
4. How would you rate the experimenter/participant interaction in terms of spontaneity? (Rehearsed – Spontaneous)
5. How would you rate the experimenter/participant interaction in terms of positivity? (Very negative – Very Positive)
6. How would you describe the quality of the rapport that you have with the participant? (Extremely poor – Extremely good)
7. How confident are you that today's experiment will be a success? (Not at all confident – Extremely confident)

(See Appendix A.9 for a copy of this scale)

Experiment/Experimenter Attitudes Rating Scale (EARS) (Nichols & Maner, 2008). A 5-item subscale ($\alpha = .74$) assessing the perceptive experience of the participant in regards to the experimental session and the researcher based on possible demand characteristics of the attitude taken towards the researcher using 10-point rating scales ranging from 'Not at all' – 'Unsure' – 'Definitely'.

1. Would you participate in a study with this experimenter in the future?
2. How friendly do you think the experimenter was?

3. How likeable did you think the experimenter was?
4. How attractive do you think the experimenter is to the opposite sex?
5. How much do you care about whether the experimenter's study works?

(See Appendix A.9 for a copy of this scale)

6.2.4. Procedure

The procedure for Experiment Two followed that of Experiment One (see Section 5.5.5. for details). Following completion of the experimental session participants were asked to complete the Experiment/Experimenter Attitudes Rating Scale (EARS) (Nichols & Maner, 2008). It was stressed to the participant that the researcher herself would not be viewing the raw data, as this may not only affect the ratings given by the participant, but also the subjective state of the researcher. In following with this, the participant was given an envelope in which to seal the completed scale on which a colleagues name was written. It would be this colleague who would actually input the raw data from this single scale on behalf of the researcher. Following the departure of the participant, the researcher would then complete the Interaction Scale (Sherwood, Roe, Holt, & Wilson, 2005) in regards to their perception of the experimental session and their relationship with the participant during this time.

6.3. Results

Table 6.1 shows the means, standard deviations, skewness and kurtosis for the within (Q-sort hexagram ratings for levels of RNG lability) and between subject variables of participant interaction, experimenter interaction and individual lability scores.

Table 6.1 *Descriptive statistics for RNG lability, participants' perceived interaction, and researcher's perceived interaction, Lability Scale (LS)*

<u>Variable</u>	<u>Mean</u> <u>(SD)</u>	<u>95% CI</u> <u>Lower</u>	<u>95% CI</u> <u>Upper</u>	<u>Skewness</u> <u>(SE)</u>	<u>Kurtosis</u> <u>(SE)</u>
Table RNG	2.84 (3.17)	1.93	3.75	-.27 (.34)	-1.64 (.66)
Pseudo RNG	2.42 (3.02)	1.56	3.28	-.01 (.34)	-.92 (.66)
Live RNG	0.24 (3.01)	-.67	1.10	-.06 (.34)	-.41 (.66)
LS	207.62 (26.85)	199.99	25.25	-.46 (.33)	-.05 (.66)

Note: N = 50

Table 6.2 shows the means, standard deviations, confidence intervals, skewness and kurtosis for the within subject variables of Q-sort hexagram ratings for levels of RNG lability and between subject variables of participant interaction and experimenter interaction and individual lability scores.

Table 6.2 *Means and standard deviations (SD) of Q-sort hexagram ratings for Q-sort hexagram ratings for levels of RNG lability (Table, Pseudo, Live) and individual lability (Low, Medium, High)*

RNG lability	Individual lability levels			
	<u>Low</u>	<u>Medium</u>	<u>High</u>	<u>Total</u>
Table	1.40	3.72	2.33	2.84
(SD)	(2.99)	(3.17)	(3.11)	(3.20)
Pseudo	3.00	2.48	1.93	2.42
(SD)	(3.06)	(3.29)	(2.60)	(3.02)
Live	-1.10	1.00	-.13	.24
(SD)	(3.45)	(2.86)	(2.77)	(3.01)
Average	1.1	2.4	1.38	4.88
<i>N</i>	10	25	15	50

Table 6.2 shows that overall, the mean scores for the I Ching ratings from the three RNG lability sources of Table, Pseudo and Live were positive, therefore, the divinations were deemed to be more appropriate rather than less appropriate to the participants. On average participants experienced greater lability scores with Table (low) RNG); than for Pseudo (medium) RNG and Live (high) RNG. When this movement was analysed using a one sample t-test against the null of zero, the difference was significant for Table $t(49) = 6.28, p < .05, d = 1.79$; Pseudo $t(49) = 5.67, p < .05, d = 1.62$. As can be seen by the respective Cohen's d statistic, these differences had very large effect sizes greater than one standard deviation. However, the difference for Live $t(49) = .563, p = .58, d = .16$ was not significant. The differences between the totals are relatively small and range from .24 to 2.84 as is the within-condition variability as shown by the standard deviations (SD) ranging from 3.01 to 3.17, although these deviations are not significant $F(3, 49) = .32, p > .05$. These findings indicate that participants rated the I Ching divinations from the Table RNG source as being more applicable than those from either the Pseudo or Live RNG sources.

6.3.1. Restatement of hypotheses

Hypothesis 1 – Overall, there would be a significant interaction effect between the levels of system lability of Table, Pseudo and Live with the individual lability levels of Low, Medium and High (3 x 3 mixed factorial ANOVA).

An initial Mauchley's test showed that the assumption of sphericity was not violated $\chi^2(2) = 3.56$, ($p = .17$). Performing a 3 x 3 mixed factorial one way analysis of variance with one within factor of RNG lability (Table, Pseudo, Live) and one between factor of individual lability (low, medium, high). A prior Levene's test showed that assumptions of variances were assumed ($p > .05$). The results show that the main effect of RNG lability was significant $F(2, 94) = 9.32$, $p < .05$, $\eta^2 = .17$. Further post hoc comparisons using Tukey's HSD did not find any significance between the levels. The effect of individual lability was significant $F(1, 47) = 46.30$, $p = .00$, $\eta^2 = .50$. The interaction between individual lability levels and RNG lability levels was not significant $F(4, 94) = .88$, $p = .48$, $\eta^2 = .04$ (Figure 6.2). Therefore, the first primary hypothesis is not supported.

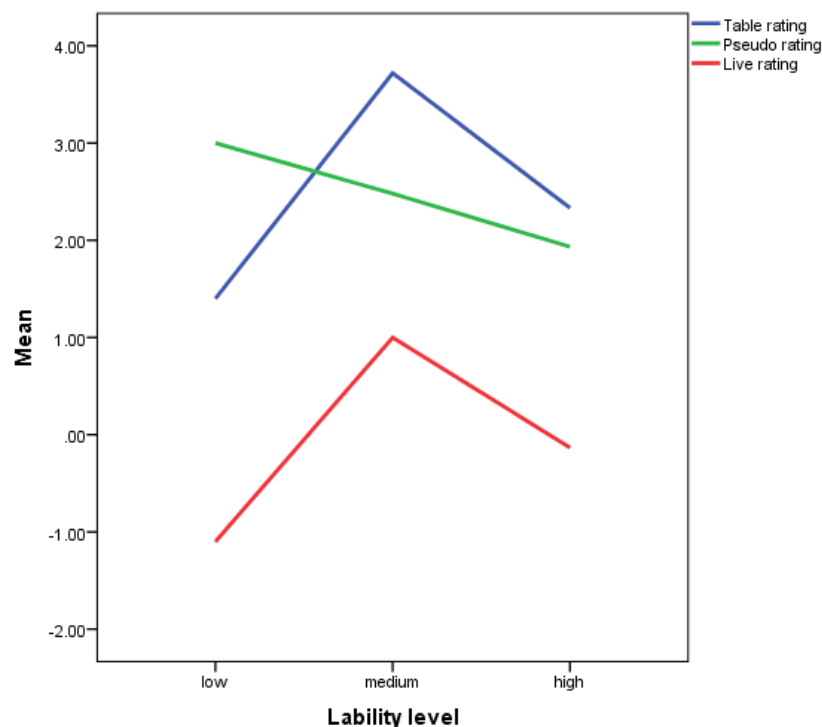


Figure 6.1 Multiple line graph showing the interaction between Q-sort hexagram ratings for levels of RNG lability (Table, Pseudo, Live) and levels of individual lability (Low, Medium, High)

Hypothesis 2: Participant interaction item scores will correlate highly with researcher interaction item scores (Pearson's correlation, 2-tailed).

As shown in Table 6.3 there is a majority of significant positive correlations between participant interaction items and researcher interaction items ratings, therefore the secondary hypothesis is supported. This shows that interaction ratings for both participants and researchers correspondingly increased.

Table 6.3 *Correlation matrix of the item scores for participant (I) and Experimenter (E) interactions and the Lability Scale (LS)*

<u>Variable</u>	<u>I1</u>	<u>I2</u>	<u>I3</u>	<u>I4</u>	<u>I5</u>	<u>I6</u>	<u>I7</u>	<u>E1</u>	<u>E2</u>	<u>E3</u>	<u>E4</u>	<u>E5</u>	<u>LS</u>
I1	—												
I2	.84**	—											
I3	.71**	.74**	—										
I4	.51**	.64**	.82**	—									
I5	.65**	.72**	.90**	.84**	—								
I6	.60**	.67**	.84**	.82**	.88**	—							
I7	.49**	.60**	.66**	.68**	.67**	.74**	—						
E1	.19	.30*	.47**	.39**	.46**	.46**	.35*	—					
E2	.41**	.35*	.55**	.47**	.52**	.50**	.34*	.84**	—				
E3	.44**	.37**	.57**	.50**	.54**	.51**	.33*	.77**	.96**	—			
E4	.37**	.30*	.45**	.36**	.37**	.34*	.22	.73**	.85**	.90**	—		
E5	.21	.20	.43**	.36*	.35*	.39**	.27	.66**	.69**	.72**	.75**	—	
LS	.25	.44**	.41**	.37**	.43**	.41**	.53**	.56**	.39**	.29*	.34*	.35*	—

Note: ** $p < .01$ level (2-t); * $p < .05$ level (2-t); $N = 50$

However, there were no significant relations between participant items (E1) 'Would you participate in a study with this experimenter in the future?' and (E5) 'How much do you care about whether the experimenter's study works?' with experimenter item (I1) 'How would you rate your current mood?'. There was also no relationship found between item (E5) 'How much do you care about whether the experimenter's study works?' and item (I2) 'How do you feel at this moment?'. No significant relationships were found between item (I7) 'How confident are you that today's experiment will be a success?' and items (E4) 'How attractive do you think the experimenter is to the opposite sex?' and item (E5) 'How much do you care about whether the experimenter's study works?'. These lack of relationships suggest that participant interest in the outcome of the study is not related to how the experimenter feels.

Furthermore, that the experimenter's attitude towards the outcome is not related to participant interest in the outcome, or on how their attractiveness is perceived.

Hypothesis 3: Participants interactions scores will correlate highly with the total score of individual lability from the Lability Scale (LS).

Table 6.4 *Correlation matrix for participant interaction item scores (E) and total individual lability score (LS)*

<u>Variable</u>	<u>E1</u>	<u>E2</u>	<u>E3</u>	<u>E4</u>	<u>E5</u>	<u>LS</u>
E1	—					
E2	.84**	—				
E3	.77**	.96**	—			
E4	.73**	.85**	.89**	—		
E5	.66**	.69**	.72**	.75**	—	
LS	.56*	.39*	.29*	.34*	.35*	—

Note: ** $p < .01$ level (2-t); * $p < .05$ level (2-t); $N = 50$

Significant positive correlations can be seen in Table 6.4 between the LS and items for participant interaction. These show that as scores on the LS increase, so do ratings on the items from the participants in regards to their interaction.

Table 6.5 *Correlation matrix for items from the participant interaction scale and the five individual lability factors*

<u>Variable</u>	<u>E1</u>	<u>E2</u>	<u>E3</u>	<u>E4</u>	<u>E5</u>
IC	.60**	.43**	.31*	.36*	.39**
CC	.10	.15	.12	.16	.13
EGO	.48**	.30*	.23	.29*	.28
EI	.39**	.21	.13	.15	.17
AC	.04	.09	.13	.08	.08

In addition, as shown in Table 6.5, there are significant positive correlations between Intuitive Cognition and all five items from the participants' interaction scale. There are significant correlations between E1 'Would you participate in a study with this experimenter in the future?' and Ego-Orientated Cognition ($r = .48, p < .01$) and Emotional Interpretation ($r =$

.39, $p < .01$). There is a significant positive relationship between Ego-Orientated Cognition and E4 ‘How attractive do you think the experimenter is to the opposite sex?’, ($r = .29$, $p < .05$). There are no significant correlations between any of the participants’ interaction items and Analytical Cognition. However, Hypothesis 3 is supported.

Hypothesis 4: Participants interaction scores will correlate highly with ratings of the three RNG system lability levels (Pearson’s correlation, 2-tailed).

Table 6.5 *Correlation matrix for participant interaction item scores and Q-sort hexagram ratings for Q-sort hexagram ratings for levels of RNG lability (Table, Pseudo, Live)*

<u>Variable</u>	<u>E1</u>	<u>E2</u>	<u>E3</u>	<u>E4</u>	<u>E5</u>	<u>Table RNG</u>	<u>Pseudo RNG</u>	<u>Live RNG</u>
E1	—							
E2	.83**	—						
E3	.77**	.96**	—					
E4	.73**	.88**	.89**	—				
E5	.66**	.69**	.72**	.75**	—			
Table RNG	.15	.07	.13	.13	.33*	—		
Pseudo RNG	-.07	-.01	.00	.05	-.21	-.33*	—	
Live RNG	.31*	.23	.15	.17	.13	.20	-.07	—

Note: ** $p < .01$ level (2-t); * $p < .05$ level (2-t); $N = 50$

As shown in Table 6.5 there is a significant positive correlation between participant interaction item (E1) ‘Would you participate in a study with this experimenter in the future?’ and the Live RNG lability level. This suggests that as scores for this item increased so did levels of ratings for Live RNG lability. As there are no other significant correlations between participant interaction items and the Q-sort hexagram ratings for levels of RNG lability Hypothesis 4 can only be minimally supported.

Hypothesis 5 - There will be a difference between genders for individual lability scores (independent t -test).

An initial Levene’s test showed that equal variances were not assumed for an independent t -test exploring the differences in the genders for Lability Scale scores. Results showed that there was a significant difference between males and females for individual

lability scores with a large effect size, $t(48) = -3.53, p < .5, d = -1.02$. In addition, differences between genders was explored for each of the five factors with significant differences and large effect sizes for IC, $t(48) = -3.93, p < .05, d = 1.33$; EGO, $t(48) = -2.20, p < .05, d = -.64$; EI, $t(48) = -2.21, p < .95, d = -.64$; AC, $t(48) = -2.10, p < .05, d = -.61$.

There were no significant differences between the genders for CC, $t(48) = -.44, p > .05, d = .13$. However, Hypothesis 5 is supported overall. As can be seen in Figure 6.1 males had lower scores on average.

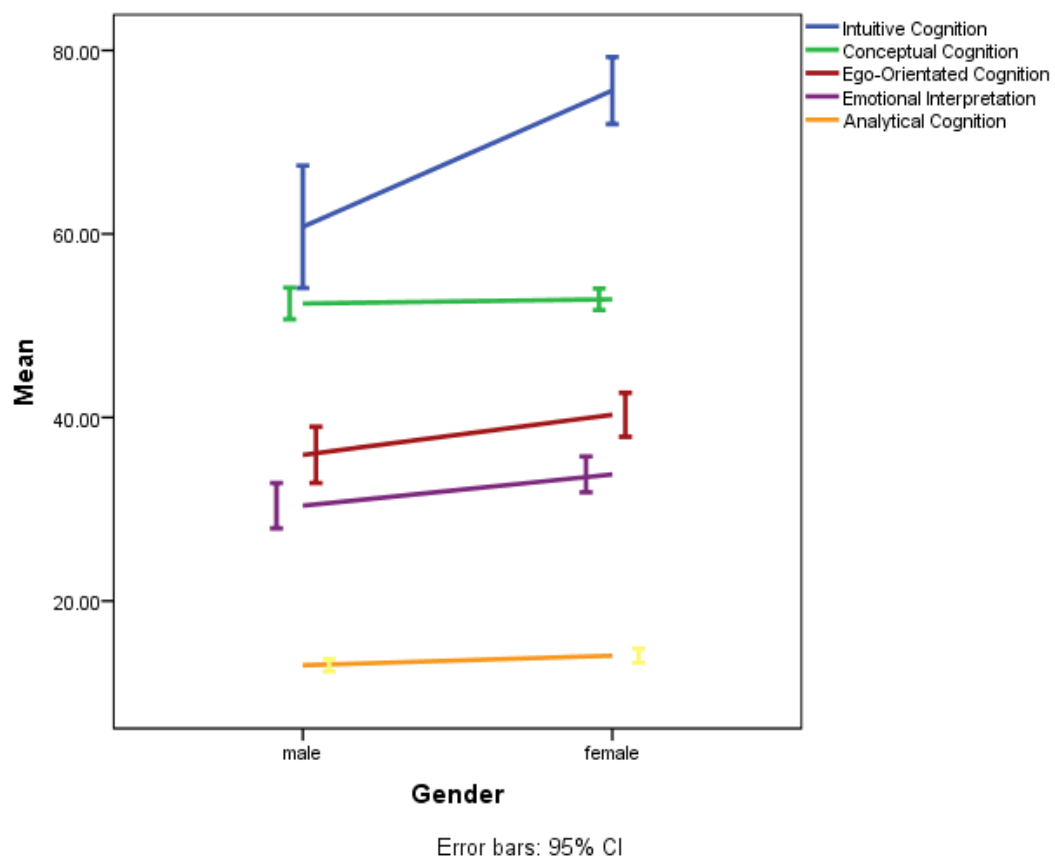


Figure 6.1 Multiple line graph with 95% confidence interval error bars showing the differences between the genders for the five lability subscales

6.3.2. Summary of Results

Exploratory statistics. There was a definite trend in Experiment Two for the mean ratings of the three RNG system lability sources to be positive. This indicates, that overall, the divinations from all three RNG lability sources were deemed to be more appropriate than less

appropriate for the participants. Furthermore, the highest average ratings of the I Ching divinations were produced by the Table RNG lability source.

Individual lability and RNG lability interaction. The findings from Experiment Two failed to find significance in the main effects of RNG lability source, individual lability level or in the interaction between levels of individual lability (Low, Medium, High) and RNG lability sources (Table, Pseudo, Live) and so could not support this primary hypothesis.

Relationship between participants' interaction and individual lability. Additional hypotheses for Experiment Two proposed that there would be a relationship between participant's interaction ratings and individual lability. There were significant positive relationships between individual item scores on the EARs (Nichols & Maner, 2008) and the Lability Scale total score and the scores from the five subscales. In particular, strong relationships were found between Intuitive Cognition and all five participants' interaction items.

Gender. There were significant differences found between males and females in relation to individual lability scores and with all the factors apart from Conceptual Cognition. On average, males had lower lability scores. This replication of

6.4. Discussion

The results from Experiment Two did not show the desired for predicted interaction between levels of individual lability and RNG system lability. However, the effect of RNG lability sources was found to be significant, although post hoc analyses showed that the Q-sort hexagram ratings for levels of RNG lability sources were not significant.

There was a significant positive relationship observed between the ratings for participant and researcher interactions, thus the secondary hypothesis is supported. These findings enable the researcher to gauge the perception of the participant as to the shared interaction post experimental session. Attempting to gain ratings during the experimental session could have a confounding and even biased influence on the outcome, by not only causing a distraction, but also potentially causing the participant to sway their views in order to meet the researcher's expectations. In addition, there were moderate positive correlations between the mean LS scores and ratings on interaction from both the participant and the researcher. These findings show that as scores increase on the LS, correspondingly, ratings for participant and the researcher also increase. This possibly suggests that it is items relating to openness within the LS which may have an influence on an individual's attitude and perception of friendliness. Establishing a satisfactory interaction within a controlled laboratory environment can be

challenging, as the remits of the experimental session need to be met under strict ethical and procedural guidelines. Plus, the duration of such sessions are normally kept short in order to control for boredom effects. Under such conditions, the researcher is required to maintain a relatively open and confident demeanour in order to keep the participants at ease. That individual lability may have an impact on the behaviour of the individual involved and how this interaction occurs potentially opens the door for future research questions. As previous research and anecdotal reports have predicted that either high or moderate levels individual processes may be impact on PK effects, it may be in this case that it is levels of low lability that are influential. Having low levels of individual lability can further be defined as having a low threshold for change within psychological and physiological processes. Thus, in the event of spontaneous PK manifesting in stressful conditions, the individual's scope for appropriate reactions are blunted. Interestingly, this pattern of dulled reactions can also be seen with the effects of chronic stress and so offer more support for theory that PK effects are a form of maladaptive coping response. As proposed by Stanford (1974a; 1974b) when investigating both PK and ESP, persons with low levels of lability are less likely to conform or adapt in response to a novel situation, especially if that situation is perceived negatively.

6.4.1. Identified considerations within the methodology

In Experiment Two, the overall appearance of the researcher within the experimental environment has the potential to skew the perception of the participant. Any biased perceptions that scientific researchers 'should be' male and within an older age bracket are challenged by the current researcher being female and within a mid-age bracket. This form of bias has only tentatively been acknowledged within previous research, for example inclusion of gender was suggested by Smith (2003), but strangely, associations were not subsequently investigated within the statistical findings. Within general psychology it is acknowledged that the appearance of an authoritative, patriarchal male researcher has the power to impact on the performance of the participant. Previous sceptic versus proponent research has been conducted using two separate male and female researchers (Wiseman & Schlitz, 1997; 1999), but it is unclear as to whether the cultural stereotypes of an 'authoritarian' male figure and the 'nurturing' female figure impacted. The researcher conducting the present studies did not standardise her appearance in relation to either the formal or friendly conditions. The simple addition of a generic white laboratory coat during the formal condition may have served to project more of the desired image to the participants.

CHAPTER SEVEN

GOAL-DIRECTED STRIVING: EXPERIMENT THREE

7. Introduction

This chapter will concentrate on the final experimental PK-RNG study which investigates the use of goal-directed striving by the participants and real-time feedback throughout the procedure⁵. In PK research, the use of the term feedback relates to information provided to participants regarding task performance. Such feedback can be visual, given verbally by the experimenter and from physiological measures or ‘bio-feedback’. Feedback can be provided immediately and/or continuously; post experimental session; not given; or false information provided. By allowing the participants a ‘practice’ session using the I Ching task in the initial stages of the procedure and offering immediate feedback before the actual I Ching task, it was hoped that there would be a difference between the individual and RNG lability interactions for the conditions. It has been shown in findings from previous research that there it is inconclusive whether inclusion of real-time feedback promotes PK effects within an experiment. Studies conducted throughout the 1970’s appeared to show apparent psi effects where participants had lacked information from real-time feedback (see Section 2.8.4 for details). Further experiments in the 1980’s involving a form of game as a PK task, as seen in ‘psi-invaders’ and the previous PK-RNG research using a racing game have been consequently modelled on such a feedback paradigm (Berger, 1987). Such investigations have yielded similar results that are suggestive of individual and RNG interaction without the inclusion of feedback. However, opposing findings in an unpublished and (as yet) unreplicated study by Broughton have observed significant findings with the use of immediate feedback on task performance. Research conceptualised by von Lucadou (1987) investigating correlations between psychological variables and RNG interaction with the additional conditions of with and without feedback hypothesized that any correlations without feedback would be random. It is currently debated by parapsychological researchers that a moderate effort of conscious striving is compatible with the manifestation of PK effects. And yet, these theories fly in the face of observations made of individuals with possible PK abilities such as Nina Kulagina and Felice Parise who maintained high levels of effort throughout procedures in order to obtain PK effects (see Section 2.3.2.).

⁵ The literature review of theoretical and previous research issues that form a rationale for the current study has been provided in Chapter Two.

Following the findings of gender differences in lability levels presented in the previous experiments, the impact of gender was again given credence in the current study's analyses.

With these paradigms at the forefront of the current experiment a procedure was implemented whereby a 'practice' of the I Ching was initially performed during a relaxed condition, followed by feedback comments intended to act as a motivation for the second I Ching task when arousal has been heightened.

7.1.1. Aims and Hypotheses

Based on the theoretical framework that individual lability contributes to the production of PK-RNG effects it was predicted that levels of individual lability would interact with levels of RNG system lability. In line with the conformance behaviour models (see Section 3.3) of system lability it was intended to assess three levels of individual lability as being low, medium and high against three corresponding RNG system lability levels of Table, Pseudo and Live. In addition, due to the multifactorial structure of the developed Lability Scale, the interaction between the five identified dimensions and RNG system levels would also be explored.

The contribution of goal-directed striving and individual lability to PK-RNG effects using a comprehensive measure had not yet been explored. However, based on previous research findings, it was hypothesised that there would be a significant effect during goal-directed striving sessions as opposed to the initial non-striving 'practice sessions.

In addition, the impact of gender on PK-RNG effects, and potential differences between males and females in individual lability scores will be explored.

Therefore, the hypotheses for Experiment Three are:

Hypothesis 1 – Overall, there would be a significant interaction effect between the levels of system lability of Table, Pseudo and Live with the individual lability levels of Low, Medium and High during the striving condition (3 x 3 mixed factorial ANOVA)

Hypothesis 2 – Overall, there would be a significant interaction effect between the levels of system lability of Table, Pseudo and Live with the individual lability levels of Low, Medium and High during the not striving condition (3 x 3 mixed factorial ANOVA)

Hypothesis 4 - There will be a difference between genders for individual lability scores (independent t-test)

7.2. Method

7.2.1. Design

The dependent variable for analyses were the Q-sort ratings given by the participants prior to selection by the I Ching computer program for the three out of sixty-four I Ching divination hexagrams. Ratings for the 64 I Ching divinations ranged from between least ‘appropriate or accurate’ to ‘most appropriate or accurate’. Possible PK effects were assessed by using the three RNG system lability sources of Table (low), Pseudo (medium) and Live (high). To illustrate, as the rating scale ranged from -7 (least appropriate or accurate) to +7 (most appropriate or accurate) an example of a prior rating could be Live (3); Pseudo (-7); Live (5).

All three studies used a 3 x 3 mixed factorial ANOVA to investigate the within subject variable of the I Ching divination ratings given by the three levels of system lability (Table, Pseudo, Live) and between subject variable of the levels of individual lability (Low, Medium, High). In addition, the three studies explored the relationships between the variables and the five factors of the LS using correlational analyses.

An additional independent variable was included of goal-directed striving measured using a short scale (Harkins & Lowe, 2000).

7.2.2. Participants

The experiment used an opportunity sample of adults recruited from the general population, colleagues, friends and relatives with $N = 50$ where 23 (46%) were male and 27 (54%) were female. The age ranged from 18 years to 70 years ($M = 42.46$, $SD = 14.47$).

7.2.3. Measures

The Lability Scale: a 71-item measure ($\alpha = .86$) developed in the initial survey-based study described in Chapter four was employed to assess individual lability. It includes aspects of cognition, neurological processes and emotion and assesses the ease of how these various aspects fluctuate subconsciously within an individual.

Three questions were rated on a 7-point rating scale (ranging from 1 = not at all/ 7 = very much), initially developed in an experiment by Harkins and Lowe (2000) on the effects on self-set goals on an experimental task:

- 1) To what extent did you strive to attain the goal you set?
- 2) How committed were you to attaining the goal that you set?

- 3) How successful do you think you were you in reaching your goal?

7.2.4. Procedure

The procedure for Experiment Three followed that of Experiment One and Two (see Section 5.5.5. for details). However, in order to establish the two conditions of not-striving and striving, the participants was asked to perform a ‘practice’ trial using the I Ching divinations. The participants were asked to cast three hexagrams using the I Ching computer program and they would have three minutes in which to complete this task. This ‘practice’ casting not only allows the participant to become familiar with the procedure but also for the researcher to generate feedback on the participants’ initial performance in the task. Once this ‘practice’ task was completed, they were advised that they could now perform the casting of three hexagrams on the computer generated I Ching program as part of the actual experimental session. They were told that if they really concentrated and made an effort that they would be able to produce hexagrams that had a relevancy to their personal question. Following completion of the experimental session participants were asked to complete the three goal-directed striving questions (Harkins & Lowe, 2000).

7.2.5. Ethical considerations

A certain amount of necessary deception occurred during the procedure for Experiment Three as the participants were not aware that the readings from the ‘practice’ session would be taken into consideration. Full details as to the nature of this deception and the experiment were provided in the debriefing.

7.3. Results

An initial paired *t*-test showed that there was a significant difference between striving and non-striving Table RNG system lability, $t(49) = 4.34$ $p < .05$, $d = 1.24$; and Pseudo RNG system lability, $t(49) = 3.156$, $p = .003$, $d = .90$ with very large effect sizes. There was not a significant difference between striving and no-striving Live RNG system lability, $t(49) = 1.145$, $p = 2.58$, $d = .33$.

Table 7.1 shows the means, confidence intervals, skewness and kurtosis for the within subject variables of Q-sort hexagram ratings for levels of RNG lability and between subject variables of individual lability and RNG lability when not striving.

Table 6.5 *Descriptive statistics for Q-sort hexagram ratings for RNG lability ratings (Table, Pseudo, Live), whilst striving and not striving (TableNS, PseudoNS, LiveNS)*

RNG	Striving					Not Striving				
	M	95%	95%	Skew	Kurtosis	M	95%	95%	Skew	Kurtosis
	(SD)	CI lower	CI upper	(SE)	(SE)		CI lower	CI upper	(SE)	(SE)
Table	3.0 (3.24)	2.06	3.90	-.36 (.34)	-.55 (.66)	.26 (2.95)	-.58	1.10	.28 (.34)	-.28 (.66)
Pseudo	1.80 (3.47)	.80	2.77	-.12 (.34)	-.96 (.66)	-.44 (3.40)	12.40	.53	.11 (.34)	-.42 (.66)
Live	.70 (3.24)	-.24	1.60	-.00 (.34)	-.67 (.66)	-.04 (3.40)	-1.0	.93	-.14 (.34)	-.67 (.66)

Note: $N = 50$

In Table 7.1 it can be seen that the averages for ratings for non-striving RNG lability sources are lowest for PseudoNS increase for LiveNS and are highest for TableNS. When this pattern was analysed using a one sample t-test against the null of zero the deviations it was found to be non-significant overall for TableNS $t(49) = .62, p = .537, d = .18$; PseudoNS $t(49) = -.92, p = 3.65, d = -.26$; LiveNS $t(49) = -.08, p = .934, d = -.02$.

However, both striving and non-striving ratings for RNG lability sources show that those for Table have the highest averages. The maximum rating for amount of striving overall was 20, with the minimum rating at 3.

Means and standard deviations for the Q-sort hexagram ratings for levels of RNG lability (Table, Pseudo, Live) and levels of individual lability (Low, Medium, High) are shown in Table 7.2.

Table 6.6 Means and standard deviations (SD) of Q-sort hexagram ratings for Q-sort hexagram ratings for levels of RNG lability Table (Low), Pseudo (Medium), Live (High) and individual lability (Low, Medium, High)

RNG lability	Individual lability levels			
	<u>Low</u>	<u>Medium</u>	<u>High</u>	<u>Total</u>
Table	2.19	4.2	1.00	2.98
(SD)	(3.27)	(2.81)	(3.16)	(3.24)
Pseudo	1.94	1.6	2.00	1.78
(SD)	(3.91)	(3.45)	(3.00)	(3.47)
Live	-.13	1.64	-.56	.68
(SD)	(2.99)	(3.24)	(3.17)	(3.24)
<i>N</i>	16	25	9	50

Table 7.2 shows that overall, the mean rating scores for the three RNG lability sources were positive. Therefore, the participants deemed the divinations as being more appropriate than

less appropriate in general. There is a definite increase in averages as the RNG lability ratings move from Live through to Pseudo and Table. When this movement was analysed using a one sample t-test against the null of zero, the deviations were significant for Table $t(49) = 6.51, p < .05, d = 1.86$ and Pseudo $t(49) = 3.63, p < .001, d = 1.04$. As shown by the Cohen's d test statistic, these effect sizes are considered large as they are greater than one standard deviation. However, deviations were not significant for Live $t(49) = 1.49, p = .14, d = .43$. The differences in scores for individual lability groups are not significant $F(2, 47) = 3.06, p > .05$, partial $\eta^2 = .12$. These findings show that there was no overall effect for RNG lability source.

7.3.1. Restatement of Hypotheses

Hypothesis 1: Overall, there would be a significant interaction effect between the Q-sort hexagram ratings for levels of RNG lability sources of Table, Pseudo and Live with the individual lability levels of Low, Medium and High.

An initial Mauchley's test showed that the assumption of sphericity was not violated $\chi^2(2) = 4.28, p = .12$. Performing a 3 x 3 one way analysis of variance with one within factor RNG system lability (Table, Pseudo, Live) and one between factor individual lability (low, medium, high). A prior Levene's test showed that assumptions of variances were assumed ($p > .05$). The results show that the main effect of RNG lability was significant $F(2, 94) = 5.15, p = .008, \eta^2 = .10$. Further post hoc comparisons using Tukey's HSD showed that there were no significant differences between individual lability levels. The effect of individual lability level just failed to reach significance, but does show a trend with $F(2, 47) = 3.06, p = .06, \eta^2 = .12$. Plus, the interaction between individual lability levels and RNG lability levels was not significant $F(4, 94) = 1.51, p = .206, \eta^2 = .06$ (Figure 7.1). Therefore, these findings fail to fully support the primary prior hypothesis.

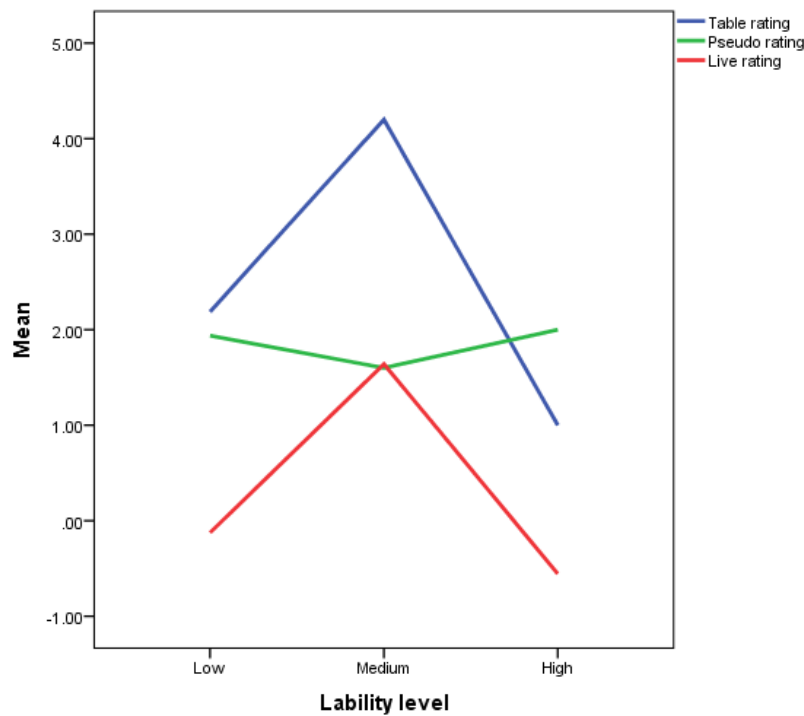


Figure 7.1 Multiple line graph showing the interaction between the Q-sort hexagram ratings for Q-sort hexagram ratings for levels of RNG lability (Table, Pseudo, Live) and levels of individual lability (Low, Medium, High) during the striving condition

Hypothesis 2 – Overall, there will be a significant effect between the levels of system lability when the participants are not striving and the levels of individual lability (Low, Medium, High), (3 x 3 mixed factorial ANOVA).

In addition, the interaction between individual lability levels and non-striving RNG system lability levels was explored. An initial Mauchley's test showed that the assumption of sphericity was not violated $\chi^2(2) = 5.89, p = .053$. Performing a 3 x 3 one way analysis of variance with one within factor of non-striving RNG system lability (Table, Pseudo Live) and one between factor of individual lability (low, medium, high). The results show that the main effect of non-striving RNG system lability was not significant, $F(2, 94) = .36, p = .698$, partial $\eta^2 = .08$. The effect of individual lability level was not significant $F(2, 47) = .445, p = .652$, partial $\eta^2 = .02$. The interaction between non-striving RNG system lability and individual lability levels failed to reach significance $F(4, 94) = .62, p = .643$, partial $\eta^2 = .03$ as shown in Figure 7.2. Therefore Hypothesis 2 was not supported.

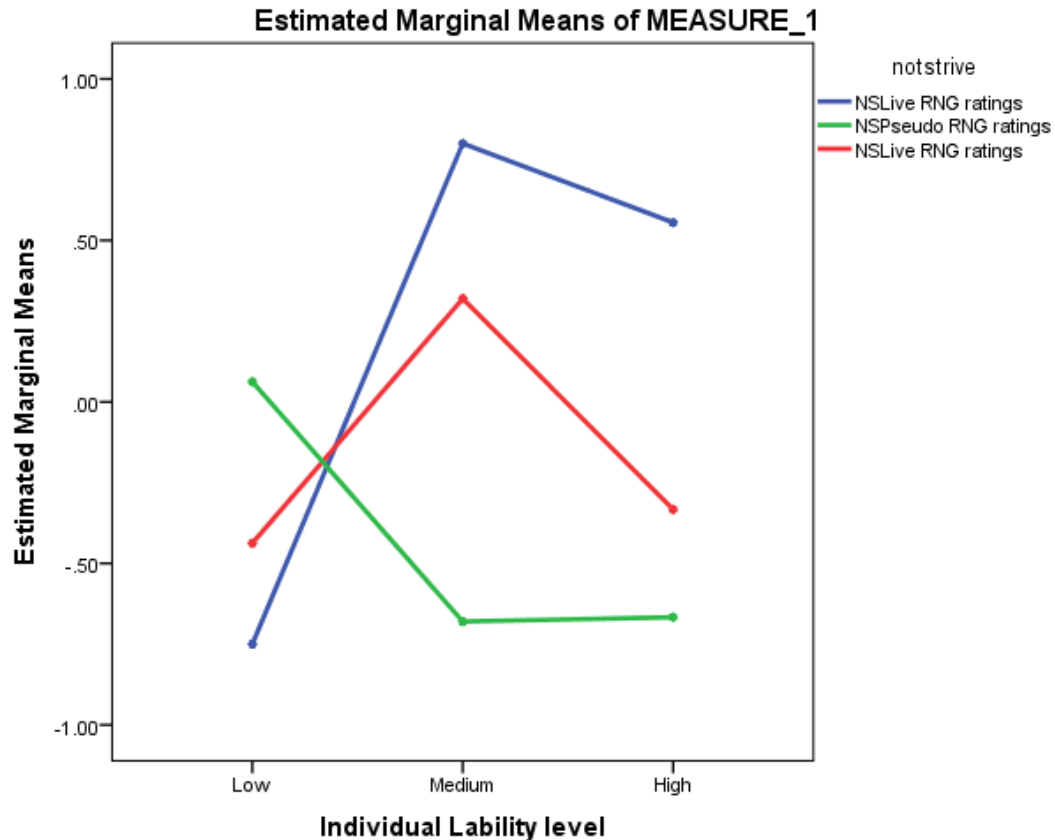


Figure 7.2 Multiple line graph showing the interaction between the Q-sort hexagram ratings for Q-sort hexagram ratings for levels of RNG liability (Table, Pseudo, Live) and levels of individual liability (Low, Medium, High) during the not striving condition

Hypothesis 4: There will be a difference between genders for individual liability scores (independent t-test)

A prior Levene's test showed that equal variances were assumed. Independent *t*-tests were performed to assess the difference between males and females in relation to scores on the Liability Scale. Findings showed that there were significant differences between the genders with a large effect size, $t(48) = -2.53, p < .05, d = -.73$.

Independent *t*-tests were performed to assess the differences between the genders for the five individual liability factors. Findings showed that there were significant differences between males and females with large effect sizes for: IC, $t(48) = -2.31, p < .05, d = -.67$; EGO, $t(48) = -2.76, p < .05, d = -.80$; EI, $t(48) = -3.29, p < .05, d = -.95$.

There were no significant differences between males and females for either CC, $t(48) = .30, p > .05, d = .09$ or AC, $t(48) = 1.82, p > .05, d = .53$.

Thus, Hypothesis 3 is supported. Findings are graphically illustrated in Figure 7.3.

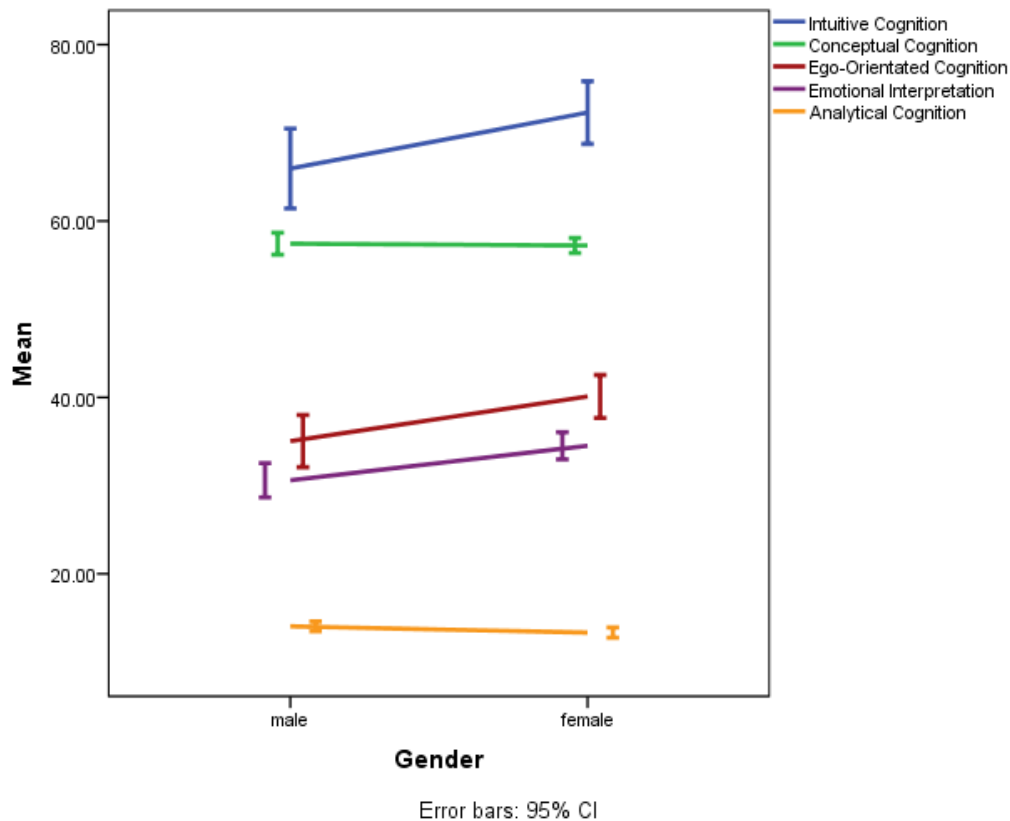


Figure 7.3 Multiple line graph with 95% confidence interval error bars showing the differences between males and females for the five individual liability factors

7.3.2. Summary of Results

Exploratory statistics. The mean ratings for the three RNG liability systems were positive overall, which shows that participants gauged the I Ching divinations as being more appropriate for the questions posed, as opposed to being less appropriate. There is a distinct pattern between the expected interaction between Table RNG system liability and high individual liability, which is consistent with that found in Experiment Two. The highest ratings of the I Ching divinations were produced by the Table RNG system, similar to Experiment Two. Furthermore, the effect sizes (Cohen's $d > 1.0$) between the significant mean differences for Table and Pseudo RNG system liability found in both experiments offers promise as to whether a moderate increase in RNG system liability levels is a contributing factor for PK-RNG effects.

Individual liability and RNG liability interaction. The findings from Experiment Three found a significant main effect of RNG liability source for the striving condition, but no significance

for individual lability level the interaction between levels of individual lability (Low, Medium, High) and RNG lability sources (Table, Pseudo, Live). In addition, there was no significant main effects found for RNG lability source, individual lability levels or in the interaction for the non-striving condition. Thus the primary hypotheses remain unsupported.

Gender. There were significant differences found between males and females in relation to individual lability scores and in particular, the factors of Intuitive Cognition, Ego-Orientated Cognition and Emotional Interpretation. The consistent lack of significant gender differences for Conceptual Cognition which primarily consists of items relating to openness is suggestive that this factor may be more generalizable across the genders.

7.4. Discussion

Experiment Three sought to explore whether goal-directed striving would impact on PK-RNG effects and the interaction between individual and RNG system lability. The procedure incorporated a striving and a non-striving condition in relation to performing the I Ching divination task. However, findings failed to achieve significance in relation to the lability interaction predictions for both striving and non-striving. The one significant result revolved around the main effect of RNG system lability in the striving condition. Such results have not been able to support previous PK research findings which have explored the impact of both intrinsic and extrinsic motivation.

From the early days of PK research using dice rolling techniques, the Rhines had observed instances of deliberate intention on behalf of their participants, involving blowing on the dice before rolling or wishing for a successful outcome (Rhine & Rhine, 1943). Such natural behaviour raised the question as to whether or not deliberate intention and motivation were a contributing factor for PK effects. Green and Green (1977) proposed that psi effects were dependent on a state of 'passive volition'. A successful outcome was achieved only by an inherent unconscious wish, rather than by active will. In relation to the findings in Experiment Three, it may be that the request by the researcher to strive for a desired outcome during the striving condition was actually detrimental to participants' performance. Indeed, there may be an argument for the impact of inhibiting 'performance effects' as the participants were continually observed by the researcher during the entirety of the experimental session.

Braud and Braud (1979) explored the state of passive volition further, by conducting both blind and limited feedback trials in a PK-RNG study. Findings showed that there were significant effects for the limited feedback condition. Although the current experiment

included limited feedback during the non-striving 'practice' condition, consisting of words of encouragement, this may not have been perceived as being proactive or explanatory enough for the participants. However, previous PK research which has included an element of competitiveness has shown that overt extrinsic motivation hampers experimental PK effects (Crandall, 1993; Debes & Morris, 1982). Conversely, these results may have also impacted on the finding from the current study, by requesting that the participants strive to attain the divinatory I Ching reading they would prefer.

7.4.1. Identified Considerations within the Methodology

In following the premise of the Self-Concordance Model (Sheldon & Elliot, 1999) whereby individuals actively seek to attain personally relevant goals rather than those based on reward or punishment, the two conditions of having a non-striving 'practice' task followed by the requested striving task, was based on previous research conducted by Broughton and Perlstrom (1986; 1992). It was important to initially examine the differences between the striving and non-striving conditions on the RNG system lability levels rather than presume an effect. Results showed that although there differences between the conditions for both Table and Pseudo RNG system lability there was no difference found between the ratings for Live RNG system lability for each condition. In order to achieve a clearly delineated difference between the two conditions future research may want to consider developing a competitive element to the I Ching task in order to explore intentional striving to better effect. In this manner, the Self-Concordance Model (Sheldon & Elliot, 1999), would still be an appropriate basis as participants would be striving for an obvious and personally rewarding goal that would impact on their psychological well-being, rather than achieving an actual material reward or a punishment. Findings from previous research by Gissurarson and Morris (1991; 1992; 1997) have produced significant results in relation to individuals employing different strategies to obtain goals. Therefore, by delineating the two conditions of non-striving and striving more clearly may allow for a better assessment of the findings. In addition, the timeline given for the protocol may need to be reviewed as being either too short or too long for participants to decide on the outcome they wish to achieve. The 'linger effect' identified by the Rhines in the early days of PK research (Rhine & Rhine, 1943) may be of some interest in this aspect. If the task duration is too short, then the possibility of PK effects via such a linger effect would not be observed.

The overall non-significant outcomes within this particular study should not be viewed as regressing the enquiry into PK effects. On the contrary, by identifying issues in the

methodology post hoc has enabled the researcher to give thought to adaptations for future research into intentional striving and PK effects.

In addition, the question must be raised as to whether viability of researching PK effects within the laboratory may be too simplistic considering the complex machinations presumed to be involved. Kennedy (1978) has reviewed this issue previously in relation to the nature of the PK tasks involved and the contextual environment of the experimental situation. As PK was proposed to be unpredictable and cryptic in nature, the fondness for developing empirical studies with a variety of variables and experimental conditions may seem rather self-defeating. The potential for additional ‘noise’ created by the methodology may actually act as a hindrance for PK effects. Although scientific remits demand parsimony within experimental studies, with the identification and segregation of definite variables, the subsequent outcomes may not be completely relatable to spontaneous real-world incidents of PK. Conversely, the multivariate nature of this series of empirical PK-RNG studies may actually be overly optimistic in procuring significant results and research into PK effects in the laboratory should perhaps concentrate on exploring one factor at a time. Indeed, it seems far more feasible for researchers to concentrate on replicating previous findings from a stripped down I Ching PK-RNG design and in order to provide evidence for recurrent PK effects than it is to jump ahead and add more ingredients to the mix – a conclusion reiterated by Storm and Rock (2014) following completion of a similar I Ching PK-RNG experiment which incorporated four additional variables. Compared to other psychological fields, parapsychology is still within the teething stages and perhaps researchers are guilty of being too enthusiastic and eager to gain insight into what other factors impact on PK before establishing how PK effects occur.

To this end, the experiments within this thesis have served to better understand this core methodological premise of the role of individual lability in PK-RNG effects further. As Roe and colleagues reflected on the lack of significant main effects in previous lability interaction studies it was proposed that the different processes involved may have effectively cancelled each other out (Holt & Roe, 2006; Roe & Holt, 2006; Roe, Martin, & Drennan, 2010). This proposal is in line with the researcher’s thoughts on the lack of significant relationships between individual lability factors and RNG lability sources found within the empirical PK-RNG studies conducted for this thesis.

7.4.2. Summary of findings from the 3 empirical studies

Although these results of the three empirical PK-RNG studies failed to find significance in the interaction between the random lability system levels and individual lability levels there is scope for further exploration. The initial descriptive results do show that there is likely to be more activity between low levels of both system and individual lability. In particular, the impact of low individual lability and what repercussion's it may have on other individual differences warrants further investigation. These findings have similarities with those shown in the initial survey (see Chapter Four), whereby there were strong significant differences found between levels of low and medium individual lability. Building on these tentative findings further, Chapter Eight provides details on results from the aggregated data of the three empirical PK-RNG experiments intending to revise the Lability Scale further. This enable greater identification of the inherent factors and investigate the individual lability and RNG lability system interaction to a greater extent. In addition, following on from the encouraging empirical results and the large effect sizes shown, the association between gender and levels of individual lability is assessed further and comparisons offered as to how these may relate to PK effects and forms of coping.

CHAPTER EIGHT

ANALYSES OF THE COMBINED DATA OF THE THREE EMPIRICAL PK-RNG
EXPERIMENTS: REVISING THE LABILITY SCALE**8. Introduction**

Employing the LS within the three sequential PK-RNG experiments has observed that the factor of Analytic Cognition, has not provided sufficient evidence of its validity as an aspect of individual lability. Therefore, it was deemed admissible to refine the LS further in order to confirm this observation. This chapter presents a further revision of the Lability Scale by aggregating the results gained from the data of the three PK-RNG experiments ($N = 147$) and conducting a final factor analyses. The intention behind revising the scale further is to better characterise the inherent factors and to simplify the scale as a whole by reducing the necessary items to a more manageable amount. Furthermore, by then performing analyses with the aggregated RNG system lability levels and these individual lability factors, it is hoped that patterns of interactions and relationships observed within the previous three PK-RNG studies may confirmed. Additional analysis exploring the impact of gender has also been considered. Research into the effects of stress and coping strategies have consistently shown that males and females tend to favour different strategies, with males using more problem-solving and females using more emotion-based techniques (Almeida & Kessler, 1998; Howerton & Van Gundy, 2009; Matud, 2004). Therefore, there is a distinct possibility that individual lability levels may also be influenced by gender alongside the known variations in cognitive, physiological and emotional processes (Mikhail, 1981; Schlotz, et al., 2008). As previous chapters have shown that low lability levels are on average more prone to interaction with RNG lability systems, it would be interesting to note whether low lability levels are more prevalent in either the male or female sample populations. At this time, it is theorised that with males using more objective forms of coping responses which have lower levels of emotional affects, that correspondingly, they may likely have lower levels if individual lability.

8.1. Method

8.1.1. Design

This final analysis intended to explore the accumulated data from the three sequential empirical studies and revise the Lability Scale further using factor analysis and confirm the underlying factors.

The analysis incorporated a 3 x 3 mixed factorial measures two-tailed design looking at the between subjects effects of levels of individual lability (Low, Medium, High) on the within subjects Q-sort hexagram ratings for levels of RNG lability (Table, Pseudo, Live). A further 3 x 2 repeated measures two-tailed analysis looked at the impact of gender on Q-sort hexagram ratings for levels of RNG lability (Table, Pseudo, High). Correlational analyses were conducted to explore the relationships between Q-sort hexagram ratings for levels of RNG lability and the overall scores from the Revised Lability Scale, the identified subscales of the RLS.

In addition, a mixed factorial 3 x 3 ANOVA was employed to investigate the interaction between levels of individual lability and external system RNG lability. The within subjects variable for the evaluation of PK effects was based on the Q-sort hexagram ratings according to relevance of the I Ching divinations from the three different levels of RNG system lability (Table, Pseudo, Live). The between subjects variable were the levels of individual lability (Low, Medium, High). Planned analyses were made at group level, exploring the within subject variables of overall scores on the Revised Lability Scale (RLS), the subsequently identified 3 lability factors of Creative Expression, Emotional Interpretation and Spiritual Interpretation and the co-variate of Gender. Exploratory analyses, including exploring relationships, looked at the identified subscales of the Revised Lability Scale and the levels of lability gained from the Revised Lability Scale (Low, Medium, High).

8.1.2. Participants

Total sample size from the accumulated data from across the 3 experimental studies was $N = 147$; (male = 72, female = 75), aged between 18 and 70+. It was decided to split the overall Revised Lability Scale scores into the three categories of Low, Medium and High lability following the same procedure as that outlined in Chapter 4. The range of scores (minimum 54, maximum 143), by three ($\frac{89}{3}$). Thus, Low lability ($n = 39$) was defined as having scores between 54 and 83; Medium lability ($n = 86$) was defined as having scores between 84 and 113; High lability ($n = 23$) was defined as being between 114 and 143.

8.1.3. Procedure

Data from the previous three empirical PK-RNG studies was aggregated. This accumulated data included the summed participant ratings according to relevance of the I Ching divinations across the three RNG lability levels (Table, Pseudo, Live); the summed scores from the initial Lability Scale; the summed mean bpm from relaxed HR and task HR. Descriptive analyses was performed on the summed data in order to explore issues of normality. The initial Lability Scale was revised further using factor and reliability analysis – the details of which are included in section of this chapter. The resulting Revised Lability Scale was then included within the planned and exploratory analyses.

8.1.4. Identifying outliers in the data

Outliers are able to skew distributions. Using Boxplots and with a category axis of gender, outliers were identified in the sample distributions for males in Spiritual Interpretation (cases 87, 140) and the Revised Lability Scale (RLS) total scores (cases 87, 140, 53). These cases were shown to be above the normal distribution scores, but were not considered harmful to the overall skew of the distribution and so were not removed.

8.2. Results

8.2.1. Revising the Lability Scale

With the initial Lability Scale revealing a good factor structure with internal reliability and with well-defined factors, it was deemed appropriate to refine the measure even further. Using the accumulated data from the three separate empirical studies, the decision was taken to further revise the existing Lability Scale and explore the comprising factors using factor analysis. These factors and the Revised Lability Scale were then included within subsequent analyses exploring the relationships and differences between variables.

8.2.2. Principle components analysis on the aggregated scores of the Lability Scale

A principle components analysis (PCA) was conducted on the scores from the 71 items (including 5 reversed items) of the original Lability Scale used within the three sequential empirical PK-RNG studies ($N = 147$). The Kaiser-Meyer-Olkin (KMO) measure verified the sampling adequacy for the analysis, $KMO = .87$ and all the KMO values for individual items were $> .50$ which, according to Kline (1994) is an acceptable minimum. This level was

purposefully increased from that used for the initial Liability Scale ($>.30$) in order to discriminate against weak items that may have detrimentally impacted on the previously identified five factors, causing them to appear redundant. Bartlett's test of sphericity χ^2 (2485) = 9362.67, $p < .05$, indicated that the correlations between items were sufficiently large enough to use PCA. An initial analyses obtained eigenvalues for each component in the data. Fourteen components had eigenvalues over Kaiser's criteria of 1 and in combination which each over explained 75.61% of the variance as shown in Table 7.1.

Table 7.1

Table showing Eigenvalues greater than the value of 1 following Principal Components Analysis and the percentages of variance and cumulative

Component	Initial Eigenvalues total	% of Variance	Cumulative %
1	20.49	28.85	28.85
2	9.52	13.41	42.27
3	4.20	5.92	48.18
4	3.03	4.27	52.46
5	2.71	3.81	56.27
6	2.48	3.49	59.76
7	1.93	2.71	62.47
8	1.72	2.42	64.89
9	1.67	2.36	67.25
10	1.35	1.90	69.15
11	1.23	1.74	70.88
12	1.18	1.66	72.54
13	1.12	1.57	74.11
14	1.07	1.50	75.61

Note: **Bold face indicates retained components**

An orthogonal rotation was performed first followed by an oblique rotation. As advised by Pedhazur and Schmelkin (1991), if the oblique rotation does not produce correlations between the factors then it is possible to use the results gained from an orthogonal rotation. As it is unclear at this time as to whether liability is comprised of factors that are independent of each other or whether the subsequently identified factors are likely to correlate, running both rotations is an acceptable procedure. However, following performing a varimax orthogonal rotation, the pattern matrix for the oblique rotation failed to materialise. Results were therefore taken from the varimax rotation. The scree plot showed an inflexion that justified retaining components 1, 2 and 3 for the final analysis accounting for 48.18 % of the

cumulative variance with a total of 34 items. An item with loadings $> .30$ on more than one factor was removed. This left 33 items on which further reliability analysis was performed. These remaining items showed good internal consistency ($\alpha = .92$). One further item was removed due to showing $\alpha > .92$ if removed. This has left a reduced scale of 32 items ($\alpha = .93$) comprised of 3 separate factors with loadings taken from the rotated component matrix, which have been categorised as: Creative Expression (28.85 %), Emotional Interpretation (13.41%) and Spiritual Interpretation (5.92%) as shown in Table 7.2.

8.3. The Revised Lability Scale

Table 7.2

Table showing the loading values of the three identified factors of Creative Expression, Emotional Interpretation and Spiritual Interpretation comprising the Revised Lability Scale (RLS)

Item number	Identified factors (32 items, $\alpha = .92$)		
	Creative Expression ($n = 15$, $\alpha = .89$)	Emotional Interpretation ($n = 10$, $\alpha = .89$)	Spiritual Interpretation ($n = 7$, $\alpha = .94$)
33 I have a vivid imagination	.82		
36 I enjoy hearing new ideas	.80		
43 (reversed) I have difficulty understanding abstract ideas	.78		
48 (reversed) I am not interested in theoretical discussion	.78		
39 (reversed) I am not interested in abstract ideas	.77		
40 Recombining existing elements in new ways	.77		
21 When I have a tough decision to make a sign will be given and I will know what to do	-.71		
71 In general, I consider myself to be a very happy person	.71		
49 I have a rich vocabulary	.71		
44 I get excited by new ideas	.70		
50 I can say beautiful things	.68		
41 I carry the conversation to a higher level	.67		
51 I enjoy wild flights of fantasy	.57		
46 I have a rich vocabulary	.54		

70 (reversed) I am not particularly interested in the emotional aspects of my life	.42
66 My emotions are almost always an authentic expression of my true thought and feelings	.86
65 My outward emotional reactions accurately reflect my inner feelings	.86
61 I am good at expressing my emotions	.79
68 I try to be honest about my emotional reactions, even when it causes me problems	.76
62 The way I experience and express my emotions helps me in my relationships with others	.76
67 I respond well in situations that call for new and unusual emotional responses	.75
63 My emotions help me achieve the goals in my life	.66
64 I try to disguise and hide my emotions	-.61
57 I like to imagine situations that call for unusual, uncommon or unconventional emotional reactions	.54
59 I would have to be a poet or novelist to describe the kind of emotions I sometimes feel, they are so unique	.45
3 A sense of purpose that seems to come from beyond the self	.84
1 A sense of communicating with something other	.83
2 A sense of communicating with a deeper self	.82
5 A sense of channelling information	.78
10 Meditation	.72
23 I have had a vision	.58
22 Sometimes an event will occur that has special significance for me only	.52

(A full version of the Revised Lability Scale can be found in Appendix A.11).

8.3.1. *Explanations for the Identified Subscales of the Revised Liability Scale*

Creative Expression: The first component accounts for 28.85% of the variance with loadings on items mainly from Goldberg's Openness to Experience scale (1999) and Averill's measure of emotional creativity (Averill, 1999). The items within this subscale suggest that there is a need to experience novelty and an openness to new experiences accompanied by a positive attitude. In comparison to the initial factor structure of the Liability Scale, although this is the strongest factor within this revised scale, it has many items in common with Factor 2 Conceptual Cognition, such as 'I have a vivid imagination' and 'Recombining existing elements in new ways', (see Section 4.10).

Emotional Interpretation: The second component accounts for 13.41% of the variance. Loadings are mainly on items from Averill's Emotional Creativity Inventory (1999) detailing items relating to the importance of expressing emotions, employing a large range of emotions and adapting emotional states to different situations. Compared to the initial liability Scale, this factor shares some items in common with the initial Factor 3 Ego-Orientated Cognition such as 'I like to imagine situations that call for unusual, uncommon or unconventional emotional reactions'. But, primarily has more shared items with the initial Factor 4 Emotional Interpretation, such as 'I try to be honest about my emotional reactions, even when it causes me problems'. Hence the decision to replicate the factor name as it suggests a consistency to this aspect of individual liability.

Spiritual Interpretation: The third component accounts for 5.92% of the variance with loadings primarily on items from Holt's Creative Cognition Inventory (2007). The items consider gauging information and perceptions from external sources. The items within this factor correspond to those of Factor 1 Intuitive Cognition identified in the initial Liability Scale, such as 'A sense of purpose that seems to come from beyond the self' and 'Meditation'. Therefore, it would appear that although there are some similarities between the item placement within the factors of the two liability measures, there is a distinct reversal to the factor structure. The initial Liability Scale demonstrated a strong primary factor of Intuitive Cognition, whereas within this Revised Liability Scale, related items are only within the weaker tertiary factor of Spiritual Interpretation.

8.3.2. *Reliability of the Revised Liability Scale*

In relation to the reliability of this revised measure, a test-retest reliability score is considered to be the most popular and it is expected that test-retest reliability analysis on this Revised

Lability Scale will be gained with its inclusion in future PK-RNG studies. However, Hammond (1995) advises that internal reliability is a more than acceptable form of reliability, as test-retest methods can show practice effects. Furthermore, the scores of both internal and test-retest are normally expected to be closely related.

8.3.3. Group descriptive statistics for the Revised Lability Scale, RNG system lability levels and the three identified individual lability factors

In order to be able to consider building a potential model from linear relationships for the optimal conditions for PK-RNG experimental effects, Table 8.1 shows the mean scores, standard deviations, skewness and kurtosis of key variables. The RNG levels are comprised of the ratings by participants to the perceived relevance of the I Ching divinations. Further Kolmogorov-Smirnoff and Shapiro-Wilks tests of normality were conducted which showed that the distributions for all these variables were significantly not normal. However, as Field (Field, 2009) observes that significance in these normality can be observed in large samples due to even small amounts of skew. Therefore, following the additional inspection of the accompanying histograms and Q-Q plots the use of subsequent parametric analyses was considered to be justified. (Histograms showing the normal distributions of the data for the RNG ratings for Table, Pseudo and Live, the RLS and the three factors can be found in Appendix A.12, Figures 1.21, 1.22, 1.23, 1.24, 1.25, 1.26, 1.27).

Table 7.1

Means, standard deviations (SD), skewness, kurtosis and standard error (SE) and z-scores for RNG lability levels, the Revised Lability Scale (RLS)

<u>Variable</u>	<u>Mean</u> <u>(SD)</u>	<u>95% CI Lower</u>	<u>95% CI Upper</u>	<u>Skewness</u> <u>(SE)</u>	<u>Kurtosis</u> <u>(SE)</u>
Table rating	1.78 (3.66)	1.19	2.38	-.23 (.20)	-1.09 (.40)
Pseudo rating	1.34 (3.53)	.77	1.91	-.03 (.20)	-.86 (.40)
Live rating	0.13 (3.06)	-.37	.63	.02 (.20)	-.52 (.40)

Revised Liability Scale	95.46 (17.57)	92.59	98.32	.38 (.20)	-.31 (.40)
Creative Expression	44.09 (9.95)	42.47	45.71	.16 (.20)	-.59 (.40)
Emotional Interpretation	32.01 (6.46)	30.95	33.06	-.22 (.20)	-.62 (.40)
Spiritual Interpretation	19.36 (5.76)	18.42	20.45	-.24 (.20)	-.43 (.40)

Note: $N = 147$

Participants rated the I Ching divinations produced by the three RNG levels (Table, Pseudo, Live) according to relevance. Ratings were gained using a Q-sort distribution ranging from -7 to +7. Ratings deemed to be very relevant would be shown as being positive, whilst ratings deemed not very appropriate would be negative. As seen in Table 8.1 here is a definite upwards shift in average ratings for I Ching divinations generated using the Live and Pseudo RNG sources, with the greatest average to be found in ratings using the Table RNG source.

Table 7.2 provides details of the descriptive interaction between individual liability and RNG liability sources indicating possible PK effects.

Table 7.2

Means and standard deviations (SD) of levels of Q-sort hexagram ratings of RNG liability (Table, Pseudo, Live) and levels of individual liability (Low, Medium, High)

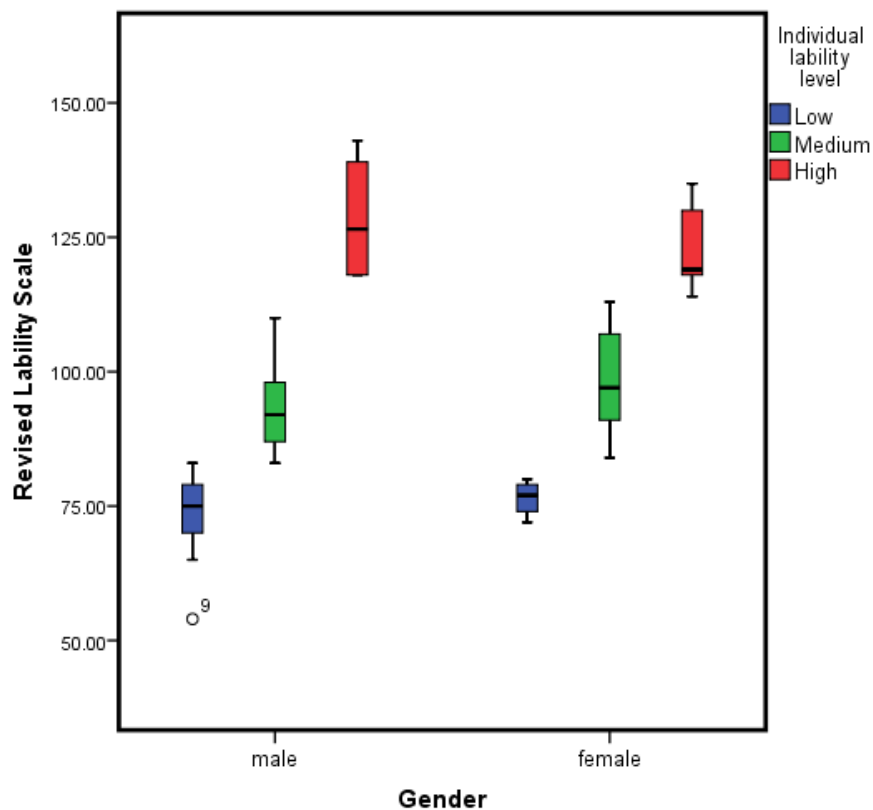
<u>RNG liability</u>	<u>Individual liability levels</u>			
	<u>Low</u>	<u>Medium</u>	<u>High</u>	<u>Total</u>
Table	1.53	2.27	1.12	1.78
(SD)	(3.27)	(3.95)	(3.35)	(3.66)
Pseudo	2.23	1.38	.65	1.34
(SD)	(3.82)	(3.61)	(3.07)	(3.53)
Live	-.50	.68	-.37	.13
(SD)	(3.25)	(2.99)	(2.94)	(3.06)
Average	1.09	1.44	0.47	1.08
(SD)	(3.45)	(2.77)	(3.12)	(3.42)
<i>N</i>	30	74	43	147

It can be seen in Table 7.2 that individuals classed as having High levels of liability achieved the lowest average rating for the I Ching divinations produced from all three RNG liability sources (Table, Pseudo, Live). On average, individuals classed within the Medium liability

level achieved greatest success overall with Low liability individuals having intermediate performance. In relation to the RNG liability sources, greatest success was achieved by the Table RNG source, with Pseudo producing intermediate results ($M = 1.34$, $SD = 3.53$) and Live having the worst success, which follows in line with the predictive pattern. These distributions in relation to males and females are graphically illustrated within the box plot shown in Figure 7.2.

Figure 7.2

Box plot showing the total Revised Liability Scale score distribution for RNG ratings of Table, Pseudo, Live for males and females



8.3.4. Correlations

Linear relationships between the key variables were explored using correlational analysis as shown in the correlation matrix in Table 7.3.

Table 7.3

Correlations between RNG liability levels, the Revised Liability Scale (RLS)

<u>Variable</u>	<u>Table rating</u>	<u>Pseudo rating</u>	<u>Live rating</u>	<u>Revised Liability Scale rating</u>
Table rating	—			
Pseudo rating	-.04	—		
Live rating	.16	.18*	—	
Revised Liability Scale	.24**	.09	.18*	—

Note: ** $p < .01$ level; * $p < .05$ level

It can be seen that all significant correlations between the variables are positive. There is a significant positive correlation between Table RNG levels and RLS scores ($r = .24, p < .01$), meaning that as Table RNG liability increases so do RLS scores. There is a positive correlation between Live RNG liability and Pseudo RNG liability levels ($r = .18, p < .05$), showing that as Live RNG liability ratings increase, so do Pseudo RNG ratings. There is a positive correlation between Live RNG liability and RLS scores ($r = .18, p < .05$), showing that as RLS scores increase, so do Live RNG liability scores.

8.3.5. Exploring the Effects and Interactions of Individual Liability and Gender on Q-sort hexagram ratings for levels of RNG liability

A 3 x 3 x 2 mixed factorial analysis of variance was conducted assessing the impact of levels of between subjects variables of individual liability taken from scores of the RLS (low, medium, high) and gender (male, female) on PK effects, indicated by the within subject variable of participants' ratings of RNG liability (Table, Pseudo, Live).

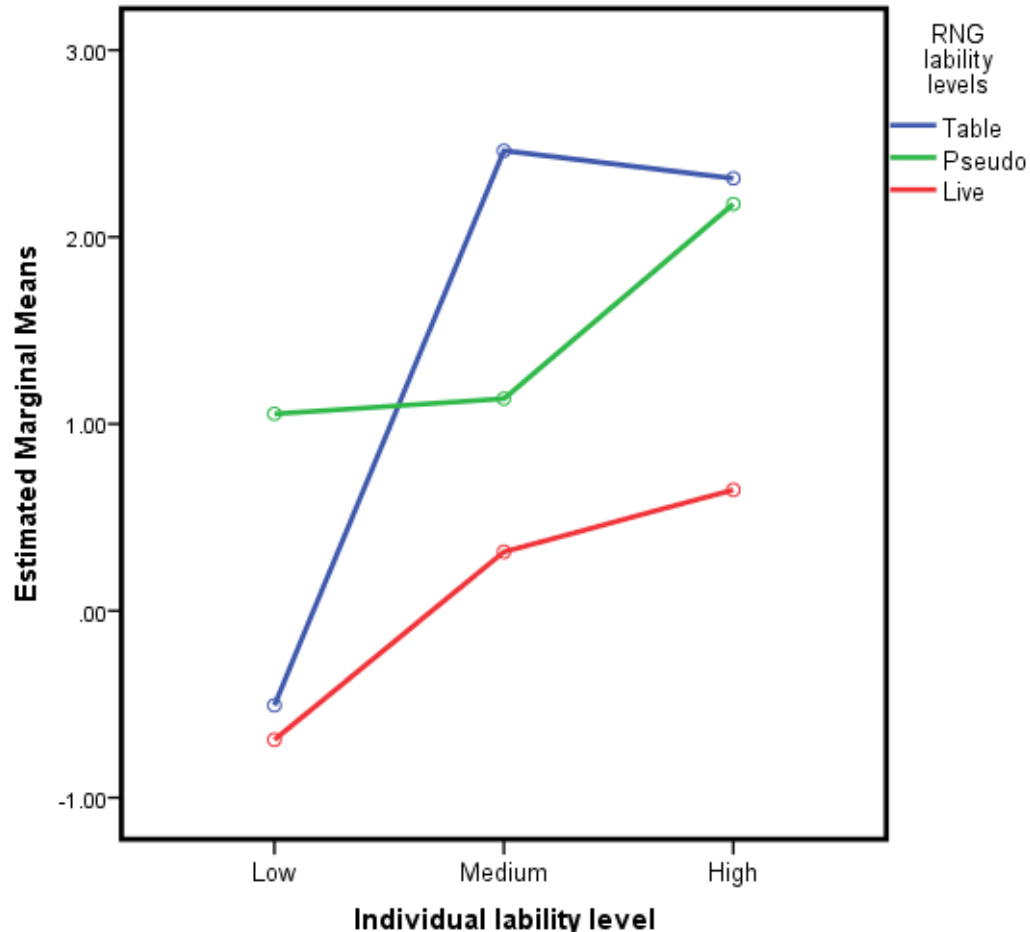
All analyses are reported at $p < .05$ level. An initial Mauchley's test indicated that the assumption of sphericity had been violated, $\chi^2(2) = .95, p = .02$, therefore degrees of freedom were corrected using Greenhouse-Geisser estimates of sphericity, ($\epsilon = .95$).

Within subject effects. There was a significant main effect of RNG lability level with a small effect size, $F(1.90, 267.71) = 4.95, p = .01$, partial $\eta^2 = .04$. Contrasts revealed that Live RNG lability was better than Table RNG lability with a small effect size, $F(1, 141) = 7.97, p = .005$, partial $\eta^2 = .05$ and Pseudo RNG lability with a moderate effect size, $F(1, 141) = 8.83, p = .003$, partial $\eta^2 = .06$.

The interaction between RNG lability sources and individual lability levels was shown to be not significant, $F(3.80, 267.71) = 2.20, p = .07$, partial $\eta^2 = .03$. However, as can be seen in Table 7.3, this result has only just failed to reach significance. Therefore, that a definite trend can still be observed in the interaction between Q-sort hexagram ratings for levels of RNG lability and levels of individual lability on the production of PK-RNG effects remains encouraging.

Figure 7.3

Graph showing the Interaction between RNG Lability of Table, Pseudo and Live levels with Individual Lability of Low, Medium and High levels



There was no significant interaction between RNG Lability levels x Gender, $F(5.35, 267.71) = .48, p = .61$, partial $\eta^2 = .003$.

There was no significant interaction effect between RNG Lability levels x Individual Lability levels x Gender, $F(3.80, 267.71) = 9.45, p = .85, \eta^2 = .49$. This means that participants' ratings of RNG levels and individual lability levels did not differ between individual lability levels and males and females.

Between subject effects. There was a significant effect of individual lability level, indicating that ratings from participants categorised as being either low, medium or high lability differed, $F(2, 141) = 5.18, p = .007, r = 46.25$.

There was no significant effect of gender, indicating that ratings from males and females were generally the same, $F(1, 141) = 2.08, p = .15, r = 9.28$.

There was no significant interaction between Individual Lability x Gender, indicating that the different categories of individual lability between males and females did not impact on ratings, $F(2, 141) = 1.37, p = .26, r = 12.22$.

In addition, relationships between the Q-sort hexagram ratings of levels of RNG lability and the factors were explored as shown in Table 7.4.

Table 7.4

Correlations between the lability subscales of Creative Expression, Emotional Interpretation and Spiritual Interpretation and ratings for RNG lability levels of Table, Pseudo and Live

<u>Variable</u>	<u>Table</u> <u>RNG</u>	<u>Pseudo</u> <u>RNG</u>	<u>Live</u> <u>RNG</u>	<u>Creative</u> <u>Expression</u>	<u>Emotional</u> <u>Interpretation</u>	<u>Spiritual</u> <u>Interpretation</u>
Table RNG	—					
Pseudo RNG	-.04	—				
Live RNG	.16	.18*	—			
Creative Expression	.34**	.21**	.15	—		

Emotional Interpretation	.09	-.07	.13	.41**	—	
Spiritual Interpretation	.04	-.01	.14	.32**	.60**	—

Note: ** $p < .01$ level; * $p < .05$ level

As shown in Table 7.4 there are significant positive correlations between items of the lability subscale of Creative Expression and Table RNG ($r = .34$) and also Pseudo RNG ($r = .21$). This shows that as ratings increased for both Table RNG and Pseudo RNG they correspondingly increased for scores on the items constituting the lability subscale Creative Expression.

There was a significant correlation between ratings for Pseudo and Live RNG ($r = .18$). This shows that as ratings increased for Pseudo RNG they correspondingly increased for Live RNG.

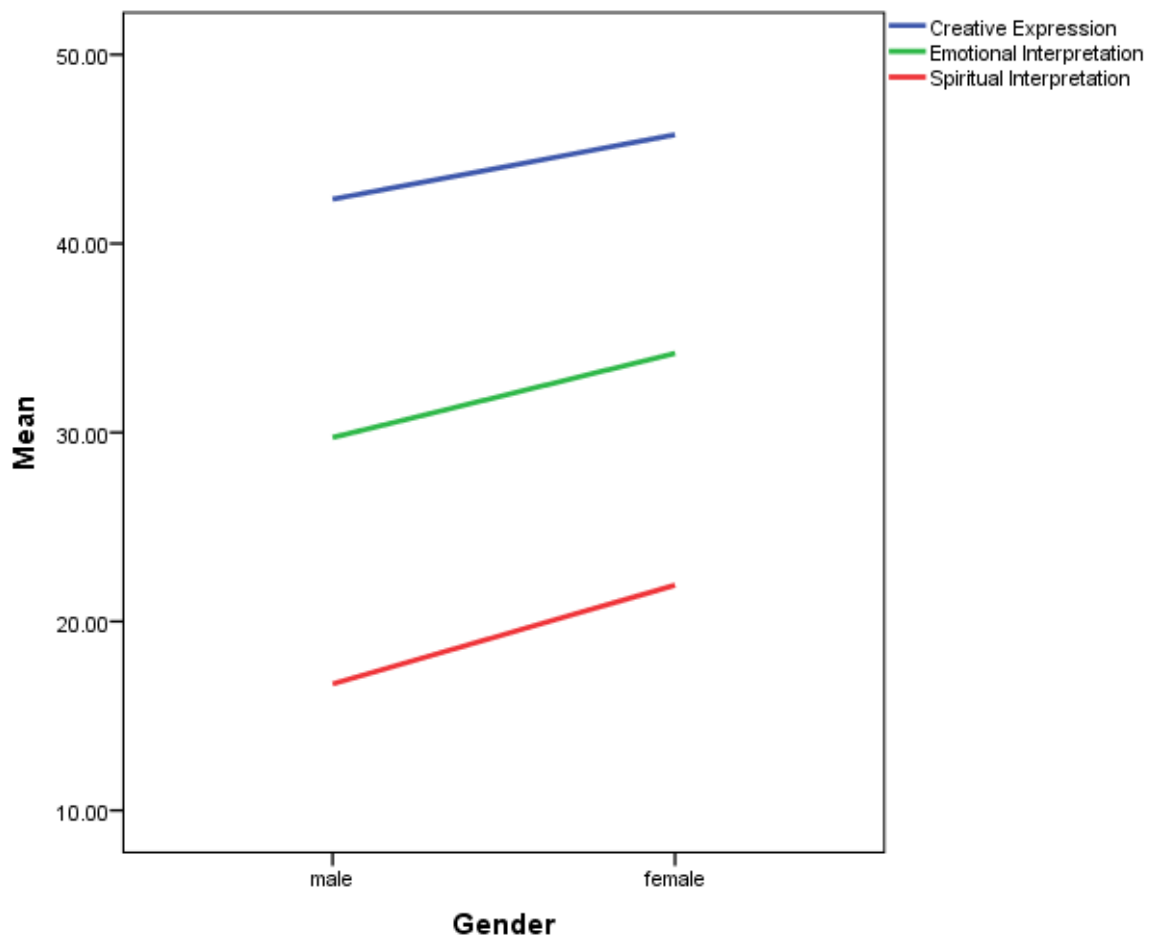
There were expected significant positive correlations between the lability subscales of Creative Expression and Emotional Interpretation ($r = .41$) and Spiritual Interpretation ($r = .32$). This shows that as scores on the items comprising Creative Expression increase so do the scores for the items comprising Emotional Interpretation and Spiritual Interpretation. There was a significant positive correlation between Emotional Interpretation and Spiritual Interpretation ($r = .60$). This shows that as scores for the items comprising Emotional Interpretation increased, so too did the scores for items within Spiritual Interpretation.

8.3.6. Differences between male and female scores and Females in Relation to the Lability Subscales

Independent t-tests were performed to explore the differences between genders in relation to the lability subscales of Creative Expression, Emotional Interpretation and Spiritual Interpretation. A prior Levene's test showed that assumptions of variance were not assumed for Emotional Interpretation and Spiritual Interpretation ($p < .05$). Scores for Creative Expression between the genders were found to be significant, $t(145) = -.21$, $p = .04$, $d = -.003$, albeit with a very small effect size. The difference between the genders for Emotional Interpretation was significant, $t(132.77) = -.441$, $p < .05$, $d = -.77$, with a large effect size. The difference between the genders for Spiritual Interpretation was significant, $t(128.82) = -6.11$, $p < .05$, $d = 1.08$, with a very large effect size. As illustrated in Figure 7.4. on average, males have significantly lower scores for the three individual lability factors.

Figure 7.4

Multiple line graph representing the difference between males and females for the lability subscales of Creative Expression, Emotional Interpretation and Spiritual Interpretation.



8.3.7. Differences in Males and Females in Relation to the Revised Lability Scale (RLS)

From the total sample of $N = 147$, it was shown that males ($n = 72$) and females ($n = 75$). An initial Levene's test showed that variance were not assumed to be equal for the factors of Emotional Interpretation and Spiritual Interpretation ($p > .05$). Therefore, for these factors, results where variances were not assumed were used instead. Independent t -tests revealed that

on average males rated lower ($M = 1.63$, $SD = 3.51$) than females ($M = 1.93$, $SD = 3.82$) for Table RNG system lability, but this difference was not significant, $t(145) = -.509$, $p = .611$, $d = -.08$. On average, males ($M = 1.49$, $SD = 3.55$) rated higher than females ($M = 1.20$, $SD = 3.52$) on Pseudo RNG system lability, but this difference was not significant, $t(145) = .491$, $p = .624$, $d = .08$. On average, males rated lower ($M = .06$, $SD = 3.14$) than females ($M = .200$, $SD = 3.00$) on Live RNG system lability, $t(145) = -.285$, $p = .776$, $d = -.05$ but this difference was not significant.

However, on average males ($M = 88.78$, $SD = 17.09$) scored lower than females ($M = 101.87$, $SD = 15.61$) for the total Revised Lability Scale score, with this difference showing as significant, $t(145) = -4.851$, $p = .037$ with a large effect size, $d = -.80$. In addition, males ($M = 42.35$, $SD = 8.78$) scored significantly lower than females ($M = 45.76$, $SD = 10.75$) for the factor of Creative Expression, $t(145) = -3.103$, $p < .05$, with a moderate effect size, $d = -.52$. On average males ($M = 29.74$, $SD = 6.86$) scored significantly lower than females ($M = 34.19$, $SD = 5.23$) for Emotional Interpretation, $t(132.77) = -4.41$, $p < .05$, with a large effect size, $d = -.73$. On average males ($M = 16.9$, $SD = 5.92$) scored significantly lower than females ($M = 21.92$, $SD = 4.27$) for Spiritual Interpretation, $t(128.82) = -6.11$, $p < .05$, with a very large effect size, $d = -1.01$. The negative direction of the effect sizes for these significant differences show that as scores for males decrease, conversely scores for females increase. As recommended by Cohen (1988), the sample sizes for both males ($n = 72$) and females ($n = 75$) were more than adequate to reach the required 80% power.

8.4. Discussion

Following on from the development of the Lability Scale (LS) outlined in Chapter Four, the LS showed strong internal reliability with the identified five factor structure also having healthy reliability. These factors were categorised as being: 1) Intuitive Cognition; 2) Conceptual Cognition; 3) Emotional Interpretation; 4) Analytical Cognition. The identification of these underlying dimensions supported the proposal that individual lability was multi-dimensional rather than a unitary construct. Therefore, it was subsequently necessary to explore this factor structure and the relationships the factors may have with additional intrinsic and extrinsic variables on the production of PK effects. The LS was included within the standardised design of a series of three PK-RNG experiments, with the methodology of the experiments and the results presented in Chapter Five and Chapter Six respectively.

However, it was observed within the findings of the three PK-RNG studies that one factor in particular, Analytic Cognition, appeared not to form significant relationships with any of the additional experimental variables. The comprising items had raised concerns as they were related to both oneiric and logical thinking, which appeared to be a juxtaposition, with neither appearing to relate to individual liability at face-value. In addition, the factor consisted of only five items, the bare minimum for a factor as recommended by Kline (1994). This suggested that the items and the factor itself may not be a valid representation of an aspect of individual liability and therefore, superfluous. A remedy for this issue was to combine the data from the series of PK-RNG studies, enabling the initial Liability Scale (LS) to be refined further using factor analysis in an attempt to confirm the original factor structure and item loadings. The resulting Revised Liability Scale (RLS) is outlined in this chapter and is also shown to have a strong three factor structure and internal reliability. Interestingly, though, the factor structure appears to be contrasting to that of the initial Liability Scale. The strongest factor for the LS was defined as Intuitive Cognition, yet a large amount of corresponding items from this original factor are shown to be within the third factor of Spiritual Interpretation for the RLS. The items within the second factor of Emotional Interpretation remained relatively consistent with those of the original factor in the LS, this the name was retained. However, the primary factor names Creative Expression has much in common with the original Conceptual Cognition factor and also, in a smaller portion, to items in the original Ego-Orientated Cognition factor. As predicted, the factor structure had no items pertaining to those included within the original fifth factor of Analytical Cognition, thus confirming suspicions that this was not a faithful representation of an aspect of individual liability.

Inspecting the descriptive statistics showed that overall individuals classified as High liability gave the lowest ratings for the I Ching divinations from all of the RNG liability sources. Bucking the trend from previous studies, it is those classed as having Medium liability that gave the highest ratings for applicability and those deemed as having Low liability giving intermediate ratings. However, when breaking down the interaction between levels of individual liability and RNG liability sources, it can be seen that the pattern predicted by the conformance behaviour models and findings from previous research held true – greatest success was achieved via Table RNG source and the least successful performance was via Live RNY liability source.

In order to assess the interaction between levels of individual liability and RNG liability sources the analyses performed using this Revised Liability Scale has found that significance had just

been missed. These results are heartening in that they show a definite trend for a possible interaction effect between internal and external lability systems. Furthermore, the main effect of RNG lability source was shown to be significant, albeit with a small effect size, with the most labile RNG source of Live being significantly better than either Pseudo or Table RNG sources. This finding bodes well for following the pattern predicted by lability conformance models, whereby a lesser labile system conforms to a highly labile system in order to produce PK effects. In accounting for this finding, there is a case for the previous interaction effects gained in past studies were not a true reflection of the role of lability systems in PK effects. The studies admittedly used a variety of already established and different measures with which to assess lability, ranging from scales concerned with personality, neurology, creativity and emotions. Within these findings is the possibility that the promising results were broadly highlighting aspects of lability within these measures. Thus, in creating the RLS the focus on the characteristics of lability has narrowed as too has the statistical possibility of PK effects emerging from the lability interaction.

In secondary goal as to explore the relationships between the RLS, its subscales and the Q-sort hexagram ratings for different levels of RNG lability sources. As previous research has explored the relationship between PK effects and other forms of individual differences such as personality states and traits (Henry, 2005; 2005), neurological conditions (Heath, 1999) and creativity (Holt, Delanoy, & Roe, 2002). The findings show that there are positive relationships between the RLS and Table RNG lability ($r = .28$) and Pseudo RNG lability source ($r = .18$). Furthermore, this pattern of correlation is repeated when observing the relationship between the subscale of Creative Expression and Table RNG lability source ($r = .36$) and Pseudo RNG lability source ($r = .21$). This particular subscale accounts for the highest percentage of variance at 28.85% and is concerned with being open to and experiencing novelty in a positive manner. What is interesting is that these are the only apparent relationships between the subscales and the different RNG sources. This finding begs the question as to whether more stable forms of external lability should be associated with this aspect of lability and even if this aspect alone should define lability per se. It would be beneficial for researchers in the future to investigate the subscales separately in order to see whether this relationship is consistent. In relation to the production of PK effects a case could be generated for exploring the interaction between high levels of individual lability against low levels of external lability, rather than predicting the converse interaction throughout the levels as shown by the framework of the conformance behaviour theories.

With regard to gender differences, it can be clearly seen that males are more likely to have lower levels of overall lability compared to females. This pattern is also apparent when viewing the differences between male and female scores and females in relation to the three subscales. Although gender differences have not been specifically discussed within the earlier chapters of this thesis or directly included as variables within the series of three PK-RNG studies, the researcher considers their inclusion in these later analyses as an important ingredient in discovering the optimal requirements for producing PK effects. The inclusion of gender as a primary variable has been sadly lacking within previous PK research, although assumptions of its impact are widely reported in real-world incidents discussed in Chapter Two. In exploring individual differences, it would be assumed that gender should be considered a priority as it is possibly the most obvious contrast. Furthermore, with known gender differences in psychological, cognitive and emotional responses it seems likely that there would be differences in the labile construct. Although such gender differences may not impact on the production of PK effects per se, they may act as a mediator to lability, which in turn may be mediated by other individual differences and further by situational context, creating a ladder leading towards PK effects. To this effect, the RLS will go some way in addressing questions as to the nature of individual lability within further PK research.

To conclude, at this time it is doubtful that an explanation for the restructuring of the factors as seen within the RLS can be offered at this time, as this research has only taken the first tentative steps towards attempting to understand the nature of individual lability. However, it is clear that the RLS reflects the synergistic impact of creativity and emotionality on individual lability. In addition, as there are no other psychometric tools existing to measure individual lability per se, the RLS is therefore a precursor to any that may be developed in the future. At these early stages of assessing individual lability it will be beneficial to conduct confirmatory analysis on the RLS in order to test the construct validity of the underlying dimensions. In this respect, it is envisaged that the RLS would be pertinent for future studies, both parapsychological, such as exploring PK and ESP effects, precognitive dreams, belief and experiences of psi; and also psychological, especially in relation to differences between the genders, lability in affective states and schizotypal behaviour perhaps. To this end, the research within this thesis has achieved one of its primary intentions – of enabling a better understanding of individual lability and its inherent characteristics.

CHAPTER EIGHT

EXPLORING INDIVIDUAL LABILITY AND ITS RELATIONSHIP TO PK-RNG EFFECTS

SUMMARY AND CONCLUSIONS

This final chapter presents summary of the thesis and discussed implications for future research. It reviews the findings and discussions from the survey-based study, the series of three empirical PK-RNG studies and the aggregated final analyses in order to assess individual lability and its relationship to PK effects. In addition, issues surrounding the methodology and the interpretation of the lability models is discussed. In presenting this overview, this chapter attempts to answer the question of whether the combination of individual differences and situational factors can actually predict PK effects.

9. Summary of the Research

9.1. Background for psychokinesis research.

Chapter Two offered a review of the history of past and present research exploring aspects of psychokinesis (PK). This parapsychological phenomena is perhaps defined more by information from anecdotal reports as well as a wealth of theoretical research, but by a lack of replicable empirical findings. Rather than attempting to prove its existence, researchers switched their attention to how it occurred. The literature outlined the findings from real-world incidents of PK, the previous empirical research and those from observational studies using ‘gifted’ individuals. It was observed that there were common elements between these different contexts that may provide a starting point for exploring experimental PK effects for the thesis. Previous research had isolated certain psychological, physiological and social factors which had offered significant results in laboratory based studies and followed the pattern of theories developed from real-world situations. More specifically, the role of subjective stress and arousal (Braud, 1985; Broughton & Perlstrom, 1986; 1992), the perceived interaction between individuals (Kennedy & Taddonio, 1976; Watt, 2010) and intentional striving (Crandall, 1993; Stanford & Fox, 1975) had offered viable lines of research. In addition, the impact of individual lability, a relatively new psychological construct had gained attention within PK research through the Conformance Behaviour Model of Stanford (CBM) (1978) and the Noise Reduction Theory of Braud (1980; 1981). These theories proposed that PK effects may be produced from the interaction between different

labile random systems. Furthermore, that this interaction was based on opposing levels of lability – with low lability levels in one random system interacting with high levels of lability in the other random system. For the purposes of experimental PK research the random systems involved the individual and an external source of randomness, commonly a random number generator (RNG). Although based on these theories, PK-RNG research exploring individual lability had no consistent measure. Methodology revolved around a gamut of so-called ‘individual lability’ measures, including physiological assessment and a battery of individual difference scales. However, even with this inconsistency promising findings did emerge. Therefore, from the point of view of this research it was apparent that there was a need to develop singular psychometric tool in order to operationalize individual lability. In addition, that this tool could then be employed in further PK-RNG experiments to investigate the interaction between individual lability levels and external random system lability further.

9.2. Understanding lability

Following on from this review, Chapter Three presented a case for the need to operationalize individual lability in much greater detail. It was necessary to gain a better understanding of what salient characteristics may be inherent and how they may interact with external labile systems to produce PK effects. Lability is defined as an ‘ease of change’ and has been used as a term in psychology to describe easy fluctuations such as those within emotional states, (affective lability), exhibited in bipolar disorders. Individual lability had been mooted as a psychological construct within parapsychology by the lability models of Stanford (1978) and Braud (1980; 1980b). Both these models suggested that individual lability may either be a contributing or mediating factor in the production of PK effects. Recent PK-RNG studies by Roe and colleagues (Roe, Holt, & Simmonds, 2003; Roe & Holt, 2005a; 2006) proposed that individual lability may be multi-dimensional and that PK research would be better served understanding the nature of individual lability by identifying such factors. The observation of lability observed within other psychological processes was reviewed in order to gauge the potential factors of individual lability. In particular, affective lability, creative lability, lability in Openness to Experience, labile responses to stress and neurological lability were considered in more detail as they also related strongly to theoretical assumptions of real-world PK phenomena and ‘gifted’ individuals. In order to make sense of how these factors related to individual lability previous PK-RNG research had included established scales within their battery of measures, yielding encouraging results. Furthermore the question was raised as to whether in the future individual PK agents or ‘gifted’ individuals may be categorised as a ‘labile’ person and the implications of whether this would be viewed

detrimentally as a type of disorder. In conclusion, the need to develop a comprehensive tool with which to measure individual lability was presented through the theories and findings of previous research and firm clues as to which items that tool may be developed from.

Building on this need further, Chapter Four presented details on developing a measure concerned solely with individual lability. In identifying themes from this previous PK research, items from the range of measures believed to relate to lability were included within a survey-based study. These items included were from The Emotional Creativity Inventory (Averill, 1999); The Creative Cognition Inventory (Holt, 2007); Goldberg's Openness to Experience Scale (Goldberg, 1999); The Complex Partial Epileptic-like Signs Scale (CPES) of the Personal Philosophy Inventory (Persinger & Makarec, 1987); Mood Lability (Akiskal, et al., 1995). In following recommendations from Kline (1994; 1999) and Field (2009), data from these items were inspected in order to identify any issues and then subjected to factor analysis. The resulting Lability Scale was comprised of seventy-one items with a respectable Cohen's alpha of .86. A principle components method was used to extract factors and an orthogonal rotation that assured the factors did not correlate was conducted using varimax, so to minimize the tendency of a general factor (Gorsuch, 1983) and maximizing the spread of factor loadings (Tabachnick & Fidell, 2001). Five stable factors with eigenvalues > 1 and accounting for 35% of the cumulative variance were identified and classified as being: Intuitive Cognition ($\alpha = .92$); Conceptual Cognition ($\alpha = .42$); Ego-Orientated Cognition ($\alpha = .78$); Emotional Interpretation ($\alpha = .71$); Analytical Cognition ($\alpha = .79$). It was noted that there were significant positive correlations relating some of these factors: Intuitive Cognition and Ego-Orientated Cognition ($r = .53$); and Emotional Interpretation ($r = .44$); Conceptual Cognition and Ego-Orientated Cognition ($r = .15$); Ego-Orientated Cognition and Emotional Interpretation ($r = .36$); and Conceptual Cognition ($r = .15$). However, there were no relationships between Analytical Cognition and the other factors. Included within the survey were two parapsychological measures: The Anomalous Experiences Inventory (Gallagher, Kumar, & Pekala, 1994) and the newly developed Rhine Psychokinesis Questionnaire (Simmonds-Moore, Rhine Feather, & Gadd, 2010). Relationships between these measures, the Lability Scale and the five factors were explored resulting in primarily significant negative correlations, indicating that in general that as levels of belief in paranormal phenomena increase, levels of individual lability decrease. In addition, scores from the Lability Scale were divided into categories of Low, Medium and High levels, enabling further analyses into the effects of an interaction between individual lability and belief in paranormal phenomena. Results showed a similar relationship, with high levels of individual lability

corresponding to low levels of paranormal belief and psychokinetic experiences. These findings are encouraging and suggestive of the lability interaction pattern proposed by the conformance behaviour theories. Preliminary investigations into gender differences showed that males and females did differ in respect to scoring on the five factors, particularly Intuitive Cognition, Ego-Orientated Cognition and Emotional Interpretation, with males scoring lower overall, than females. The items in these factors are concerned with emotional responses and the subjective perception of the self and the findings fall in line with those proposing that females are more likely to unconsciously employ emotion-based cognitive processes (Thalbourne, 1995).

9.2.1. Experiment One.

The primary hypothesis predicting interaction between levels of individual lability and Q-sort hexagram ratings for levels of RNG lability sources was not found to be significant. There were no significant main effects of RNG lability source, or for levels of individual lability. In tentative support for the second primary hypothesis there was a moderate positive relationship between Factor 5 Analytical Cognition and Live RNG lability source, ($r = .30$). This findings suggests an equitable relationship between these variables – as scores on items from Analytical Cognition increase, so do ratings from the most labile Live RNG source. This factor is comprised of items concerned with rational thoughts which suggests that as individuals begin analysing a situation, they are more likely to interact with highly labile external systems. This possibly tendency does mimic the lability interaction aimed for in this research. Furthermore, there was no relationship between scores of perceived stress and the LS, ($r = .21$). However, there was a positive relationship between perceived stress and Factor 3 Ego-Orientated Cognition, ($r = .41$). The items within this factor are primarily concerned with the perception of the self through one's thoughts and feelings in relation to the outside world. That there is a relationship between such a factor and scores from a subjective self-report measure is perhaps unsurprising. It would be supposed that individuals who score highly on a factor concerned with the self would necessarily have high levels of personal reflexivity. It may even be further proposed that this factor may relate to levels of narcissism, which has been considered previously to impact on paranormal beliefs. Roe and Morgan (2002) have provided interesting evidence of the prevalence of narcissistic traits against high levels of paranormal belief which attempted to replicate previous research conducted by Tobacyk and Mitchell (1987) who used out-of-body experiences (OBE) as a mediating factor. Central to this premise is the need for control over perceived stressful occurrences or situations (Irwin, *Belief in the paranormal: A review of the empirical literature*, 1993) and

further, for individuals to feel special or important in some unique way – either by declaring to have paranormal abilities or to believe that they channelling effects from a higher source. In addition, earlier personality studies had found a strong correlation between narcissistic tendencies and the egocentric need to control within interpersonal relationships (Raskin & Novacek, 1989) with distinct similarities to fantasy prone personality. This is relationship between fantasy proneness, paranormal beliefs and perceived experiences has further support from research conducted by Irwin (1990). There were significant differences between males and females in relation to individual lability and the five identified factors.

9.2.2. Experiment Two

There was no significant interaction between individual lability levels and RNG lability sources. However, there was a significant main effect for RNG lability sources and for individual lability. These findings bode well in that they show that the separate variables of individual lability and RNG lability sources do merit exploration in the production of PK effects. There were no relationships found between the five factors of the LS and RNG lability sources. However, in relation to exploring the additional variable to the participant and researchers interaction, there was a different between interaction scores for both parties in the formal and friendly conditions. This finding confirms the theories of Wooffitt (Wooffitt & Allistone, 2005; Wooffitt, 2007) and Schmeidler (Schmeidler & Maher, 1981a; Schmeidler, 1997) that manipulating social factors can greatly impact the perception of the individuals involved in an experimental environment. Such social factors to be aware of include the attitude of the researcher, as included within the present study, verbal cues of language, tone modulation and silence and non-verbal cues of gesticulation, bodily movement and choice of apparel. Participants have expectations that an experimental session is conducted by a person projecting an image of competence and authority. However, cultural stereotypes may presume that such a researcher would be necessarily male and patrician in appearance. Researchers not meeting this prior expectations may unconsciously skew a participant's subsequent performance in either direction. Previous research has actually offered support for positive outcomes to be gained from a researcher being perceived as being open and friendly (Schlitz, Wiseman, Watt, & Radin, Of two minds: Sceptic-proponent collaboration within parapsychology, 2006). However, when testing this as a secondary hypothesis, the difference between I Ching ratings for RNG lability sources for friendly and formal conditions the results failed to reach significance. It is noted that the protocol to distinguish the two conditions may have been too subtle – for the formal condition, the researcher relied on silences and brusque speech. However, this may not have been enough to provoke a change of

perception in the participant. The researcher is a female of mid-age and based on the stereotypical images of a nurturing female, this alone may have been enough for the participants to deem her as being friendly, even within the formal conditions. Further support on gender differences can also be seen in early ESP-gender studies on experimenter effects conducted by Pratt and Price (1938) who are male and female. During experimental procedures using sample groups of all male and all female participants, Price observed that the male participants of Pratt appeared subdued and did not communicate with him, and subsequently scored significantly lower than the all-female participants used by Price. The explanation offered for these results was that Pratt was deemed as using a more formal manner, whereas Price behaved in a friendlier and open fashion. Research by Snel et al., (Snel, van der Sijde, & Wiegant, 1995) on the cognitive states of individuals classed as believers and non-believers in parapsychological phenomena, (using Schmeidler and McConnell's Sheep/Goat Questionnaire (1958)), found that believers were significantly more likely to be 'field dependent' – dependent on the context of the environment for perceptual information compared to non-believers $t(103) = 2.98, p = .004$). This finding is suggestive that the overall experimental parapsychological environment has the ability to influence the perceptive impressions of those involved. Individuals who are more 'field independent' are considered to be more analytical and not so reliant on the context of the situation, possessing the ability to structure information into an understandable form for themselves. Therefore, it adds weight to the notion that being able to alter or skew an individual's perception of the overall environment in regards to the experimenter's attitude necessarily impacts on subsequent results. However, it must be noted that although at the time of the research, the cognitive processes of individuals was only a burgeoning area of interest on the impact of individual differences in parapsychological research this study only takes the psi component of ESP into consideration. Future studies may want to follow previous research in using alternating male and female researchers for both conditions and to standardise apparel – such as the addition of a simple white laboratory coat – in order to reduce the sense of the researchers' individuality.

9.2.3. Experiment Three

There was no significant interaction between levels of individual liability and RNG liability sources. There was no significant effect of individual liability, although this finding only just failed to reach $p < .05$, it can be stated that there was a definite trend. However, there was a significant main effect for RNG liability. Again, these findings are heartening in supporting the case for continuing to explore the role of individual and RNG liability sources

in PK research. There were no relationships found between the five factors and RNG lability sources. The secondary prediction, that there would be a difference between ratings of the I Ching from the RNG lability sources when participants were either striving or not striving was not supported. In following with protocol from previous research which has also investigated the impact of intentional striving, it is suggested the future research might include a more competitive element to the I Ching task or to at least offer a reward on completion of the task. Such a reward would not necessarily need to be monetary or actual, but could be along the lines of the researcher offering enthusiastic feedback following a 'practice' session. As previous research offers that high levels of striving may actually be detrimental to PK effects (Broughton & Perlstrom, 1986; 1992), subsequently, it would be predicted that success would be more likely during the relaxed 'practice' condition of the session. However, although this has been shown to be replicable for ESP studies, judging from recorded observational, anecdotal and experimental PK research, the amount of specific results are limited. In addition, although it has been shown within other fields of motivationally orientated psychological research that immediate feedback and critique serve to enhance subsequent performance, at this time it is still debateable as to whether immediate feedback has the potential to either hinder or help PK effects during experimental procedures. Indeed, research has also suggested that PK effects are more likely to occur in experimental research via a linger effect following a high level of intentional striving.

9.3. Methodology of the series of PK-RNG studies

Following the development and reliability testing of the Lability Scale (LS), the background and methodology for exploring individual lability on PK-RNG effects in a series of three studies was outlined in Chapters Five, Six and Seven. Previous PK-RNG studies employing particular PK tasks were outlined, such as competitive computerised games (Debes & Morris, 1982; Schechter, Honorton, Barker, & Varvoglis, 1983). Although findings from this research suggested that such tasks are more effective in producing PK effects if there is a personal investment in the outcome for the participants, the overtly competitive nature of the tasks appeared to be detrimental. Therefore, further studies developed divinatory computer-based PK tasks which were deemed to hold more personal relevancy (Braud & Schroeter, 1983). In particular, Storm and Thalbourne (2002; 2009) adapted the divinatory I Ching process which proceeded to produce interesting results. Recent studies by Storm (Storm, 1998; 2002; 2009) and Roe and colleagues (Holt & Roe, 2006; Roe & Holt, 2006) further utilised this I Ching task and in order to assess the personal relevancy ratings more succinctly, included the Q-sort method as part of the task. Therefore, the participants were required to

rate readings as being either more or less appropriate to a posed personal question (+7 to -7). The readings were produced by three Q-sort hexagram ratings for levels of RNG lability sources (Table, Pseudo, Live) and in keeping with the aim to investigate the interaction between levels of individual and external system lability, the LS was further categorised as having scores of Low, Medium and High. The three empirical studies followed a standardised procedure comprising of completing the LS and I Ching task. Each separate study included an additional exploratory variable identified from the previous research in the preceding chapters: Experiment One ($N = 47$) included perceived stress; Experiment Two ($N = 50$) included the participant-researcher interaction; Experiment Three ($N = 50$) included goal-orientated striving. Two primary hypotheses were generated for the three studies: Firstly, it was predicted that there would be a significant interaction between the levels of individual and RNG lability sources, based on the conformance behaviour theories. Secondly, that there would be relationships between the five factors of the LS and the RNG lability sources. Further secondary hypotheses were generated in order to explore the additional variables for each separate study: Experiment One predicted a relationship between perceived stress and the LS; Experiment Two predicted differences in interaction between formal and friendly environments; Experiment Three predicted differences in I Ching ratings when striving and not striving.

Inspecting the initial exploratory statistics showed that Experiment Two and Three shared a trend for the participant samples rating the divinatory readings as being more appropriate to them overall. Furthermore, on average these two studies showed the highest ratings were produced by the Table RNG source. However, Experiment One showed that overall, ratings of the I Ching were consistently negative, showing that participants thought they were less applicable to their question. In opposition to Experiment Two and Three, on average ratings from the Table RNG lability source were lowest. However, it may be that the sample of participants within the present study did not hold such divinatory readings as meaningful and therefore did not become suitably engaged enough to generate significant lability interactions with the RNG.

9.3.1. Aggregation of data and the Revised Lability Scale

Chapter Eight outlined the decision to combine the data from the three empirical PK-RNG studies in order to accrue a larger sample size ($N = 147$) on which to conduct further analyses. Following use of the Lability Scale within these studies, the researcher decided that in order to gain greater understanding of the inherent characteristics and to promote ease of

use, that it could be revised further. Therefore, another factor analyses was performed using the principle component method and a varimax orthogonal rotation. The scree plot produced identified three factors to be retained with eigenvalues > 1 and accounting for 48.18% of the cumulative variance. The remaining Revised Lability Scale (RLS) was comprised of 32 items ($\alpha = .93$) and 3 factors defined as: Creative Expression ($n = 15$, $\alpha = .89$); Emotional Interpretation ($n = 10$, $\alpha = .89$); and External Impressions ($n = 7$, $\alpha = .94$). Creative Expression had many items in common with the initial Conceptual Cognition and was concerned with experiencing and openness to novelty. Emotional Interpretation shares many items in common with the initial Emotional Interpretation and stresses the importance of expressing emotions and adapting emotions to different situations. External Impressions has similar items to the initial Intuitive Cognition factor and gauges information and perceptions from external sources – both environmental and spiritual in nature.

The researcher decided that the Revised Lability Scale should consist of a five-point rated Likert Scale, ranging from ‘1’ – Totally disagree to ‘5’ Totally Agree. The decision to use a five-point Likert Scale was made after researching the impact of social desirability in completing both dichotomous and Likert rating self-report scales. Friberg et al. (Friberg, Martinsson, & Rosenvinge, 2006) have shown that ‘fake’ scores identifying instances of social desirability are more apparent when using a purely dichotomous version of a scale compared to the same scale using a Likert point system. Here, the researchers offer that scoring bias in self-report scales has three components – the individual’s true score plus their acquiescent score, plus a score from random error. Likert scales are favourable to dichotomous scales due to the increase in rating options which are able to balance out this sum. In addition, Furnham (1986) has offered that social desirability represented in potential scoring bias is not dependent on situational responses, but appears to be a stable trait. The inclusion of negating items within such a scale, that is using negative rather than positive language, also serves to control for potential bias. At this time, the RLS has four negating items which require the individual to reverse any potential bias in scoring.

On average, it was shown that individuals classed as having High lability achieved the lowest ratings of the I Ching for the RNG lability sources (Table, Pseudo, Live). Persons classified as having Medium lability achieved the best performance. Furthermore, ratings from the Table RNG lability source achieved the greatest success with Live RNG lability showing the least success. This findings builds support for the impact of both internal and external lability sources acting as a catalyst for PK effects.

9.3.2. Gender

The decision to include gender as an additional variable was based on the trend observed initially within the survey findings and then throughout this series of PK-RNG experiments. There was a significant difference in relation to lability levels and gender, with males having observably lower scores overall. The inclusion of gender as a variable is justified by previous real-world and empirical findings theorising that the gender of a PK agent may have both physiological and psychological significance. The PK-REG research studies conducted by the PEAR laboratory found distinct differences as to the pattern of interaction with high and low REG system levels and males and females. Plus, on average, males had stronger correlations with both levels overall (Jahn R. G., Dunne, Nelson, Dobyns, & Bradish, 1997). As stated by Dunne (1998) in Chapter Two, it would be remiss of researcher to consider developing a conceptual model of PK and not consider gender as an important factor. Indeed, an interesting PK study which also assessed gender and age alongside expectancy and experimenter variables was conducted by Jacobs, Michels and Verbraak (1978). Using a sample of 324 participants with an almost equal number of males and females and aged roughly between five and sixty-five years old the participants were tested by nine different experimenters, including the three authors. A three way analysis of variance found that on the whole adult and older females tested by the three authors had the higher scores, with males tested by the authors having lower scores. This observed difference between the genders lends support to the focus now trained on gender differences within the current research.

9.3.3. Interaction between individual lability, RNG lability source and gender

The primary hypothesis of the thesis – that of the predicted interaction between levels of lability and RNG lability sources – was further investigated but with the additional between subjects effect of gender. The interaction between RNG lability sources and individual lability levels was shown not to be significant. However, this result only just failed to reach significance and showed another definite trend which remains encouraging. There was no interaction effect between RNG lability sources, individual lability and gender, showing that there was no difference between males and females with varied lability levels rating the RNG lability sources. However, there was a significant effect of individual lability, whereby ratings of the I Ching divinations differed between individuals categorised as being either Low, Medium, High lability. There was no significant effect of gender, showing that ratings from

males and females were the same overall. There was no significant interaction effect between individual lability and gender.

9.3.4. Gender, the RLS and the three subscales

It was shown that there was a significant difference between genders and scores on the RLS, mimicking the pattern perceived in the previous PK-RNG studies with males scoring considerably lower overall than females. Following this finding, gender differences between the three subscales of the RLS, Creative Expression, Emotional Interpretation and External Impressions, were explored further – with findings mirroring this same pattern as males had again, lower scores for all three factors than females.

Such findings are an exciting development for PK research, as there has been a lack of consideration in previous and recent PK research as to the impact of gender on PK effects. In this respect, they may be justified as the findings do show that gender may not have a direct effect on the production of PK effects. However, the findings do show that it does have an obvious association with levels of lability, which in turn, could impact PK effects. Support for this findings must come from the earlier work of the PEAR laboratory, who established standardised protocols for series of PK studies using a random mechanical cascade (Dunne, Nelson, & Jahn, 1988) as shown in Chapter Two. The studies considered the impact of different levels of system lability but unfortunately did not include correlations with other variables in the studies. However, the most significant correlates were shown to be with gender differences, which created a definite asymmetrical pattern in the mean shifts. Females were found to have bimodal distribution, found to be caused by a few participants with exceptional performance and often actually opposite to intention. In contrast, males had a more balanced pattern overall and on average, have more significant pre-intention PK effects. Furthermore, pairs of either same sex or mixed gender participants found that significant results were observed from mixed sex pairs – especially those with a personal bond. PEAR concluded that for any conceptual model developed regarding PK-RNG effects, gender must be included as an important factor (Dunne, 1998).

9.3.5. Relationships between the three factors and RNG lability sources

Correlational analysis between the three factors and the Q-sort hexagram ratings for levels of RNG lability (Table, Pseudo, Live), showed significant relationships between Creative Expression and Table RNG ($r = .34$) and Pseudo RNG ($r = .21$). Therefore, these associations are suggestive of potentially ‘labile’ individual becoming involved in novel

situations and events and unconsciously adapting, as can be seen in real-world incidents of PK agents reported by Roll (1978; 1983; Roll & Persinger, 2001). In addition, these findings offer encouragement for further research which might wish to place exploratory emphasis on each of the lability factors within PK-RNG research.

9.4. Issues to Consider in PK Research

Recent research by Storm and Rock (2014) has also included the Q sort methodology with an I Ching task for a PK-RNG study. In very much the same vein as the research within this thesis, Storm and Rock have explored the impact of four different variables on the production of PK effects; 1) pro-attitude (as aspect of the psychopraxia theory); 2) paranormal beliefs. 3) trait reactance (the resistance to compromise); 4) meaningfulness. Although the design differed from the empirical studies in this research in that just one levels of true RNG was used (providing a single hexagram), the overall method of rating divinations for relevancy (+7 to -7) was the same. Findings showed that there was no significant effect for the Q-sort method. However, there was the Q-sort scores were shown to be positive for participants with high levels of paranormal belief and on average, had increased PK-RNG scores. Out of the four predictor variables, meaningfulness had a small significant relationship with Direct-Hits (+7) and with Binary-Hitting (+6 and +7). Paranormal belief scores correlated significantly with pro-attitude and meaningfulness. However, the researchers also concluded that the using the Q-sort grid within the methodology was perhaps too complicated for the participants, potentially hindering the production of PK effect and advised that future PK-RNG studies should request feed-back on the complexity of the PK task. This conclusion harks back to a previous review by Kennedy (1978) on the complexity of tasks in PK studies in an attempt to understand how much either information processing or goal-orientation plays a part on PK effects. The review encompassed the use of die rolling and PK-RNG tasks and considered the amount of objects to be manipulated, the number of randomness levels, the probabilities within the task, ESP, experimenter effects and additional extraneous variables. He concluded that although PK was potentially a goal-orientated process, it was likely to be impacted by additional information and that experiments with different hit/miss probabilities were likely to offer clearer models for how information processing impacts on PK effects.

Charles Tart (1984) has also presented an interesting theory that an unconscious fear of psi effects by individuals may also impact within parapsychological studies – holding true for both participants and researchers alike. Out of many possible pathological limitations that have extraneous influences in any experiment, Tart discusses states of denial, rationalization,

distraction and dissociation, which suggests create an innate resistance to the manifestation of psi effects. He reflects on studies developed by Batchelder (1984) and Isaacs (1984) whereby the protocol within a sitter-group PK session reflects this unconscious fear and seeks to readdress the possible effects. Tart states that there is an underlying assumption by most scientific researchers that participants represent a passive element within an experiment. However, Tart argues that this is an erroneous assumption, that (perhaps especially) within a parapsychological study, participants are being asked to pro-actively instigate the outcome – either consciously or unconsciously. Tart further states that the participants' perception of being manipulated by the researcher – however benignly – generates resistance. In keeping with this attitude, he posits that participants should be reclassified as collaborators that researchers work with, rather than experiment on. This redress should then allow a greater understanding of the individual differences of all the people involved in the undertaken research. On a final note, Tart makes the accusation that parapsychologists are perhaps a little too willing to rely on results based upon the 'religion of the 0.5 level' and achieving significance, rather than observing the actual effect sizes identified by the statistical findings, most of which could be deemed as negligible.

Therefore, the nature and style of how individual researchers approach this communication is an obvious starting point in investigating how it may impact as a known factor, rather than as an insidious confounder. Although researchers such as Schmidt (1993) favour a PK-RNG experimental protocol that precludes the possibility of experimenter effects by using independent observers, as posited by Rhine and Pratt (1957), it appears that it is the interaction created between the researcher and the participant is important to the production of PK effects within the laboratory. And yet, Schmidt (1993) does admit that individuals involved within an experiment trying to produce PK effects may unconsciously have the ability to skew the outcome to that desired - both to positive and negative effects. Therefore, it is proposed that to produce significant results the individuals involved within the experimental environment need to create a short, positively viewed, mutually beneficial relationship. However, as Rhine amended in later years, it is questionable that a PK experiment can ever be designed that completely mitigates the influence of an individual other than the actual participant (1975).

Finally, to insert a further note of caution, another less savoury explanation as to the apparent phenomenon of psi-conducive and psi-inhibitory experimenters must be introduced, involving the robustness of previous studies and, indeed, the veracity of the individual personalities involved. Thus, it must also be considered that some methodologies are more

robust than others, resulting in either significant or even non-significant effects. Even during the very early days of scientifically studying anomalous phenomena, doubts have been cast on the integral honesty of the individual experimenters and the participants involved.

Unfortunately, within science in general there are precedents for researchers to, shall I say, be slightly coy regarding results to make them appear more acceptable to their peers. With many researchers still pursuing the ‘holy grail’ of parapsychological research as being that of replicability, it is perhaps necessary that this field in particular needs to be subjected to rigorous experimental auditing.

Braude (1979) finalizes his review of causal theories of PK by showing that the observational theory proposed by Schmidt (1975b; 1993)– which relies on retrocausation for experimental PK effects on random systems by allowing the participants observable feedback on their performance – have certain advantages. The primary advantage states that all aspects of psi phenomena are actually just one of PK and is intrinsically non-causal. However, Braude argues that this unified theory of psi, although attractive, is unlikely, given that it is undetermined as to what physiological processes are involved with psi phenomena. As with other bodily processes, it would be more likely to discover that different aspects of psi are reliant on different physiological mechanisms. Furthermore, retroactive PK cannot be classified as non-causal (the effect occurring before the cause of the effect), but is rather circular or looping as the PK effects are assumed to occur after feedback is presented. In addition, Braude also evaluates the cybernetic model of psi favoured by Stanford (1977; 1978) which relies on psychobiological causation via the organism acting on constant information processing and motor processes. However, when considering this theory, Braude states that the complexity of the manipulated random system would impact on the PK outcome, as would timing.

Following the findings of gender differences in lability levels in Experiment One, the impact of gender was again given credence in the current study’s analyses. This focus on the differences between males and females in psi research is in direct contrast to statements offered by both Bem (2011) and those of Wagenmakers et al.; (Wagenmakers, Wetzels, Borsboom, & van der Maas, 2011) in their review of Bem’s experimental psi research. These researchers have previously stated that gender is not an important factor in discovering the characteristics of psi functioning and so have openly advocated its exclusion from analyses. Perhaps controversially (for these particular researchers), the present series of experiments have found significant effects in relation to lability levels and gender – with males appearing to exhibit lower lability levels than females. If, as proposed by the research program, that

individual lability is a characteristic of psi functioning then it should necessarily follow that aspects concerning lability are worthy of study. The fact that the researcher for this thesis was female should also be taken into consideration. As a review by Zingrone emphasized (1988), as with most scientific disciplines, there is a smaller proportion of females compare to males within parapsychology conducting active research and publishing papers. Although this review was conducted almost thirty years ago, this divide is still apparent today. Therefore, the awareness of a female conducting research and within a marginal field creates speculation regarding their motivations. Data from the 2005 Gallup Poll has shown that for Great Britain, females tend to have almost twice as high levels of paranormal belief than males. Therefore, it would be highly likely that participants would assume that as the researcher is a female she would be a 'believer'. The gender of the researcher may have had particular impact on the data of Experiment Two, which explored the participant/researcher interaction. Items included within the Interaction Scale the participant was required to complete included 'How attractive do you think the researcher is to the opposite sex?'. Although this item has a valid precedent, in that perceived attractiveness can impact behaviours and responses, I felt it did place both myself as the researcher and the participant in a slightly awkward position. Although their responses remained confidential and were not completed in my presence, the joint awareness of the question must have created social pressure for the participant (both males and females) to answer in a more neutral manner than they would if asked to judge a photograph or image. Although discussions regarding the role of gender within psi experiments may be a rather uncomfortable issue for some researchers, it is an important one and does need to be addressed. Therefore it may be beneficial to explore gender as a social construct in relation to the participant/researcher interaction.

Plus, I must reiterate the interesting findings gained from the research in this thesis regarding the obvious divide between the genders in relation to levels of individual lability, with males having significantly lower levels than females. Even more so, as I campaigned to have gender included within the analysis as I specifically wanted to explore the relationship to individual lability and perceived stress. There are corresponding facets of these gender differences with the coping strategies employed by males and females. It is known that males favour more goal-directed coping methods when experiencing stress, whereas females err towards more emotion-focused responses (Lazarus & Folkman, 1984). It is conceivable that the more emotionally static coping tendencies exhibited by males may have an association with individual lability, even at the physiological level, by being influenced by hormonal processes. Furthermore, I believe that these findings open up another door for PK/Lability

research. Previous lability models by Braud (1980) had emphasized the assumption that to be highly labile was conducive for PK effects – be it for an individual or an external random system. However, consequently, the findings regarding gender may offer scope to consider the opposite that it is more likely that having low levels of lability is of importance. This bias towards emphasizing high levels of individual processes, personality states and traits as being worthy of interest is rather prevalent within psychological fields. Consider the interest that high levels of psychopathy, neuroticism, schizotypy, religiosity and for instance and then compare the amount of research specifically exploring low levels of each. Whereas, research which focuses on low levels of lability and the relationship to gender and PK effects in this instance is a valid proposition.

9.5. Evolutionary aspects of PK?

Although many theories are offered as to the ‘what’ and ‘how’ questions which arise regarding psi phenomena, it would be concerning that the foundational question of ‘why’ is not addressed in a suitable manner, as proposed by Broughton in his inaugural Presidential Address to the Parapsychological Association. Parapsychologists acknowledge that PK effects exist and have identified some of the possible processes that may be involved in occurrences, but there is still debate as to the usefulness and purpose of PK. In relating possible psi ability in individuals to need-serving theories such as those formulated by Stanford (1978) it is believed that such phenomena may fulfil either a psychodynamic or biological role. Braude (1979; 2002) inserts a note of caution in labelling the manifestation of psi as ‘ability’ as opposed to a function. He argues that if psi aspects are theorised as being an innate physiological process in all individuals, but only being observably presented in some, this does not allow them to be classed as being having an ability, such as with an individual gifted in music, for example. As other physiological functions such as digestion are not regarded as having ability within only certain individuals, than to refer to either ESP or PK aspects as such is detrimental to any research conducted. The following section reviews proposed evolutionary theories as to the existence of psi and PK phenomena and the opposing arguments as to whether PK has any role in the modern world.

The proposal of a psychodynamic ‘need’ for psi ability relates to the requirements of the individual ego. In this instance, psi phenomena may be manifested as either a conscious or unconscious function such as a defence mechanism or following cases of transference within a therapeutic environment when emotions are inappropriately directed (de Carvalho, 1996). However, as with other psychodynamic theories, it falters in its lack of adequate objective

assessment, and cannot be expected to be fitted to a model with phenomena that is still so lacking (currently) in substantial facts.

Alternatively, as mentioned within the previous section reviewing experimental PK, the biological ‘need’ of psi ability would not necessarily be confined to human beings, but also to other living organisms. A popular historical concept, which is still prevalent today, is that psi and PK may be an inherited trait, endowed solely on individuals with the correct genetic make-up (Cohn, 1994). It is theorised by researchers that psi has developed from the evolutionary need to monitor the surrounding environment (even during sleep), as befits an organism that is deemed both predator and prey (Taylor, 2003).

However, if this was indeed the case, how does this explain the apparent lack of abundance of psi and PK functioning within the general population, and instead observe only certain ‘gifted’ individuals? The opposing and rather unpopular theory explains this dearth of ability via gradual and systematic de-evolution of psi traits, which are no longer biologically necessary as the modern world has progressed. Therefore, taking its lead directly from Darwin’s original evolutionary theories (Darwin, 1859), regarding perpetration of select individual differences, any such abilities present within certain individual would now be viewed as an aberration rather than as a ‘gift’ and the lack of predictability a tangible sign of inherent instability – hence the unpopularity. Furthermore, Darwin’s tenets regarding evolutionary adaption as a necessary means of survival also has impact on the aforementioned theories of coping, which are instigated to primarily overcome perceived threatening situations (Lazarus & Folkman, 1984).

Conversely, it is still this characteristic unpredictability observed with PK phenomena that builds a case for evolutionary development, especially when viewed within the constraints imposed by contemporary societies. It is acknowledged that even though biological changes are frequently termed as ‘evolutionary leaps’, they actually consist of very small alterations over time spans of sometimes thousands of years (Darwin, 1859). It may also support additional theories that the varying aspects of psi will also gradually be reduced and begin to concentrate on specific processes.

Furthermore, the evolutionary theory has support in the apparent unconscious volition of PK phenomena in particular, whereby it may only be manifested following the subduing of other sources of cognitive interference (Schmeidler, 1990), which also has direct connotations for the previously mentioned ‘noise reduction’ theories.

In addition, there is also scope to suggest that if there is an inherent capacity for psi and PK abilities within the general population, that these abilities should also have the potential to be expanded upon using appropriate training. In following this line of research, parapsychologists have previously attempted such training using the apparent relationship between psi processes and imagery as a basis. However, findings remained inconclusive for both ESP and PK scores and drew criticism from other researchers in regards to the methods. Taylor (1993) conducted a study using gymnast as participants and it was observed that the strength of PK effects were proportional to the imagery training received beforehand by the individual participants and subsequent results showed a distinct overall significant correlation ($r = 0.63, p < .01$).

However, despite the apparent success of this research and the earlier efforts of Parise (Honorton, 1974) in duplicating Kulagina's PK methods, until researchers are able to verify the exact processes involved in the production of psi, according to Taylor (1993), the preparation of such training can currently only be speculated upon.

9.6. The Researcher as Psi-Inhibitory?

There are those that may say that the disappointing results from the empirical studies regarding the predicted lability interaction are explainable due to the researcher being a psi-inhibitor in a similar vein to Susan Blackmore (1982; 1985). Yet, I feel, that this explanation is too readily available for psi researcher to use in defence of unsuccessful outcomes – a parapsychological ‘Get out of jail’ card if you will. Perhaps controversially and in opposition to previous researchers such as Schmeidler (1997); Palmer (1971; 1972) and Schlitz et al. (Schlitz, Wiseman, Watt, & Radin, 2006), this researcher is not comfortable that an acknowledged declaration of being either a ‘sceptic’ or a ‘proponent’ is at all useful in explaining results. It is obviously expected that I would have an invested interest in the outcome of the experiments, regardless of the outcome, with more of a focus on the practicalities and whether or not the methodology proved to be manageable. Rather, it appears to be the individual participant's subjective perception of the researcher's attitude that may be of more importance in determining subsequent performance and outcome. As probably the majority of parapsychological researchers will avow, being asked if ‘they believe’ in parapsychological phenomena is almost certainly the question most commonly asked to them. It is almost certainly assumed by others that by conducting research into parapsychology phenomena necessitates a ‘belief’, unless it is actually openly refuted by the researcher. Even then, such a declaration can still be left open to subjective interpretation by others. As with

other dinner party topics of politics and religion, I have no interest in justifying my own preferences as to the existence or efficacy of psi effects, or being placed in neat category purely due to the field of research I am in. Researchers in parapsychology hail from diverse fields such as psychology, sociology, quantum physics, anthropology, history, medicine, neuropsychology to name but a few. Is it fair to label all of us as proponents of psi just because we study it? Furthermore, the researcher placed within this position is not only required to make this refutation but as identified by Lamont (2007), be prepared to openly justify their position. As can occur, researcher's own personal opinions of parapsychology can adapt throughout their researching career with results (both significant and non-significant) acting as a catalyst to a change in attitude. The question then asked should be whether such changes perforce any subsequent change in findings? At this time, the researcher in question is too new to such investigations for others to confidently state which side of the coin they fall – if any. As Lamont (2012) has more recently stated the apparent statistical failing of empirical studies and the lack of psi success only serves to conversely demonstrate possible evidence of the fickle nature of anomalous phenomena. This notion of the 'elusive' characteristics of psi has been offered earlier by Beloff (1994) in relation to the poor status of replicable results within parapsychological studies and has now become an integral part of the scientific testing. However Kennedy (Kennedy & Taddonio, 1976; Kennedy, 1994; 2003) has argued that this lack or replication of findings and the frustrating fickleness of psi phenomena refutes the 'normal' stable requirements for statistical testing. Rather, the individual differences of the experimenter, including gender, must be considered in relation to experimental psi studies and even with regards to the assessment of power effects in statistical analyses. As our understanding of what factors constitute individual lability and how lability interactions between random systems work is tentative at best, there is an argument that the physical presence of an another individual within the experimental environment was enough to impact. If, according to Stanford's CBM, the weaker random system is able to conform to a stronger random system, there is the possibility that the researcher herself presented as an alternative individual random system to which the other systems of the participants and the RNG conformed. There is a proposition for the researcher to be too psi-conductive perhaps, thus skewing the eventual outcome of PK effects? Future studies would benefit from assessing the researchers labile and psi capabilities beforehand within a pilot study, in a similar vein to the research by Smith (2003). For studies requiring a group of researchers, there is scope to include such data as covariates within the final analysis. Furthermore, the notion of being either psi-conductive or (in this case) psi-inhibitory during experimental

studies can only be theorised with an accumulated body of evidence under an individual researcher's belt. As yet, fledgling researchers such as myself cannot yet be labelled after their first tentative forays into empirical psi research. Methodologically, the researcher was aware of limitations involved with the design, including the lack of informative subjective self-report measures for the researcher and participants to complete. Such measures, similar to those included in the survey by Smith (2003), would have assessed both state and trait susceptibilities, self-belief and attitude towards parapsychology, thus acquiring a more rounded view of the personalities involved. Instead, the study can only offer a brief snapshot of the perceptions from both individuals contained within the experimental environment on which to base assumptions. Furthermore, extrinsic factors may have impacted without the conscious knowledge of the researcher – an awareness of time restrictions for completing each experiment and the series of experiments contained within the study; hunger; and other distractions. Without direct observations at the time by independent observers or recordings, the researcher cannot be sure that unconscious bodily cues relaying information were not performed by herself and subsequently picked up by the participant, (and vice versa) – for example glancing at a watch, fidgeting and sighing. These actions and others would be subjectively interpreted and therefore impact on the perception of the interaction between themselves, even within the 'friendly' experimental condition.

On reflection, perhaps by preselecting participants from those who believe in psi, have had previous PK experience or believe that they possess psi abilities – may be of more benefit in anticipating significant PK effects in accordance with the work of von Lucadou and colleagues (von Lucadou, 1987) (von Lucadou, Lay, & Kunzmann, 1987). However, the present study builds on the premise proposed by Braude (1979; 1981) that PK processes are latent within all persons rather than the selected few and may be triggered unconsciously within certain conditions. Expressing prior beliefs and experiences has not necessarily equated with reliable experimental PK effects. Controversially, the number of variables considered within the study design may have themselves created too much 'noise' within the data to be able to observe the perhaps more subtle PK effects produced from lability interaction, arguing a case for 'less is more' in experimental PK-RNG studies.

Yet, von Lucadou and colleagues (von Lucadou, Romer, & Walach, 2007) when discussing psi research in relation to Generalized Quantum Theory (GQT) (Atmanspacher, Romer, & Walach, 2002) proposed that empirical studies should potentially include many different entanglement correlations in order to mitigate the apparent elusiveness of phenomena. In this respect, they appear to be advocated a variety of included variables with

which to investigate psi. In addition, PK effects are considered to be only of ‘intermediate complexity’ in relation to alleged poltergeist effects and so are viable candidates of empirical research. In this respect, against the common protocols for other fields of science, they advocate an approach exploring contributing factors to psi phenomena, rather than focus on causal mechanisms. However, the researchers also suggest that the methodology employed to study such phenomena should not be detrimental to the production of PK effects. In this respect, there appears to be a fine balance between enabling a number of recommended entanglement correlations to be investigated and also to provide optimal conditions for PK effects to occur. In addition, von Lucadou (2011) proposed that PK effects could be viewed on a socio-psycho-physical continuum, encompassing psychosomatic experiences as possibilities as well as PK effects. In order to mitigate a ‘Cartesian cut’ between purely mental entities and external entities which would involve the need to physically measure both, von Lucadou theorizes that instead, PK effects are derived from a correlation entanglement of both. This theory has lent weight to the concept of lability as acting as a contributing process for PK effects, since in order for such an entanglement of endogenous and exogenous processes to merge, there is a requirement for a mediating process such as lability. In addition, there is a possibility that the theory of transliminality could be related to this process involvement. Transliminality (Thalbourne, Bartemucci, Delin, Fox, & Nofi, 1997), suggests a boundary thinness enabling the passage of information between conscious and unconscious states. In this respect, it may be argued that transliminality and lability may show the similar contributing factors. Yet, where transliminality proposes the transference of information, lability is rather seen as being the process involved in that transference. This supports the concept of lability as a vehicle for both individual and contextual factors in the production of PK effects and follows von Lucadou and colleagues’ (von Lucadou, Romer, & Walach, 2007) proposition about the appropriateness of considering contributory elements in psi research, rather than causal mechanisms.

In relation to the two theoretical lability models reviewed within this thesis – that of conformance behaviour and noise reduction – it is possible to consider aspects of both as being relevant to the current experimental research into striving and individual states. In accordance to Braude (2002), there is no reason to discount the entirety of either model. This holds true perhaps especially in relation to the conformance behaviour model where previous experimental research has shown that the physiological state of the individual and the experimental conditions has an impact on subsequent PK effects. It may be more worthwhile to view PK effects as an aspect of psychobiological processing where a directional influence

is not yet understood. Experimental PK research favours the use of specific random target systems from the early use of throwing dice and rolling balls to the now sophisticated RNG systems. However, the findings from these studies still begs the question as to why PK effects are only apparent on these specific targets within the experimental environment (especially in relation to blind targets), rather than other systems and even objects within the immediate locale. And yet, in reports of spontaneous PK and poltergeist occurrences individuals are believed to effect large objects in the surrounding area, such as swinging lights, without any conscious direction. In contrast, from the observation of individuals such as Nina Kulagina within PK studies it is apparent that PK effects were focused on specific objects and with a great deal of personal effort within the experimental environment, such as a compass needle, without any other objects in the environment – the table the compass was placed on for example – being effected. However, on a more positive note, the questionable unpredictability of PK does allow for a broader perspective when researching PK effects, rather than be restricted to generalizing findings from any one suggested PK-RNG experimental design or even one narrow theoretical model. Instead, it would be of more practical use to explore the possible many and various types of PK effects with a similar bouquet of experimental designs.

9.7. Summary and final thoughts

This concluding chapter has established that gaining a clearer understanding of individual and situational factors is key in exploring the production of PK effects, whether in a laboratory or real-world environment. By defining and operationalizing individual liability via the research in this thesis has been beneficial in this quest. Both the initial Liability Scale (LS) and the evolved Revised Liability Scale (RLS) have demonstrated a robust factor structure, solid item content and predictive ability making it suitable as an assessment tool for future research for both parapsychological and general psychological studies.

The PK-RNG experimental studies, although not able to support the primary hypothesis of this thesis, have attempted to directly and immediately replicate results using sequential sessions and a standardised procedure. The lack of significance of the predicted liability interaction may be more telling than if significance was gained. As previous research was forced to measure individual liability using a wide range of differing established measures, and this casts doubt over the true nature of their results. It is possible that these previously promising findings were serving to highlight the innate aspects which comprise liability. The lack of significant findings may add support to the Decision Augmentation Theory (DAT)

(May, Utts, & Spottiswoode, 1995), which proposes that experimental micro-PK (or micro-Anomalous Perturbation in the terminology used) does not exist. Rather, instances of micro-PK can occur in real-world situations but are based on precognition. That is, that an individual subconsciously makes decisions based on anomalous information which then enables that desired outcome to occur. In attempting to prompt PK-RNG effects using a variety of contributing variables within an experimental environment would therefore become redundant. However, the conclusions of DAT do not mitigate the previously successful empirical PK studies conducted over the years, especially the series exploring PK and lability conducted by Braud (Braud & Braud, 1973; 1981) and more recently by Roe and colleagues (Roe, Davey, & Stevens, 2004; Holt & Roe, 2006), from which the research in this thesis takes its cue. What may be of more concern in further attempt to investigate experimental PK effects is the time-line involved. A common thread throughout many of the previous PK research has been that a series of related empirical studies have been conducted over a relatively long period of time (years). The duration of such research has a variety of worthwhile factors to consider in the creation of the optimal conditions for experimental PK effects to occur. It has perhaps enabled the researchers to become habituated to the protocol employed and therefore more relaxed during experimental sessions, thus impacting on the perception of the participants and creating the desired for open atmosphere encouraged by Rhine (1948), Schmidt (1975b), Batchelder (1984) and Heath (1999). Although actual experimental sessions are of a short duration, the longevity of the research undertaken may aid in diffusing the onus of achieving successful outcomes for both researchers and participants, thus enabling the production of PK effects, under more 'passive volition' conditions, perhaps.

Considering the surprisingly large effects sizes gained throughout the empirical studies in this research, the complexities of discovering the role of lability in the production of PK effects may be better served in exploring the impact of lability on gender. As identified by Jawer (2006) in his research on individuals classed as being 'sensitive', there are apparent gender differences in relation to psychological, physiological and emotional processes and in levels and forms of paranormal beliefs, with females being deemed more naturally 'hypersensitive'. According to the results gained in this research, this gender divide is also apparent not only in levels of individual lability, but within the compromising factors. It was noted that out of the five individual lability factors Conceptual Cognition, which is concerned with openness, was not affected by significant gender differences. This suggests that this dimension of lability is more generalizable across genders and is not impacting by the

individual and contextual variables presented within the empirical studies. It could be argued that as participants were involved in a novel situation, that of an experiment, that a degree of openness would be apparent throughout.

The lack of previous empirical research on gender differences in PK research has left a void in being able to adequately address the question of whether individual differences can actively predict PK effects. In addition, the effects of situational and environmental factors on individual lability is yet to be explored further. The impact of such resonates with the theories of Roll (1978; 1983) and Rogo (1978; 1980; 1980) regarding spontaneous PK and poltergeist activity, whereby persons unconsciously exhibit PK effects as a coping reaction to stressful circumstances, emotionally inhibiting interpersonal dynamics and/or novel situations. This connection between individual lability to aspects of creativity is an intriguing result. Although Holt and colleagues have previously explored creativity in relation to subjective paranormal experiences (Holt, Delanoy, & Roe, 2002) and whether artistic populations are more responsive to psi events (Holt, 2007), as yet, the relationship between creativity and lability is still predictive. However, the primary factor identified within the Revised Lability Scale defined as Creative Interpretation, is comprised of items relating to an openness and positive attitude towards experiencing novel situations – a key concept within the creativity construct. A tentative possibility suggested by the researcher is that PK effects may be born from a negative attitude towards novel situations, reflected in the opposing pattern of individuals with high levels of lability interacting with low RNG system lability levels. However, the researcher allows that this is only a germ of an idea at this time and that such a hypothesis would require thorough and systematic investigation. Furthermore, as proposed by Stanford (1974a; 1974b) when investigating both PK and ESP, persons with low levels of lability are less likely to conform or adapt in response to a novel situation, especially if that situation is perceived negatively. Yet, on completion of her own study, the researcher hopes that the development of the RLS and the optimistic findings from the survey and empirical studies will do much to encourage other researchers in their pursuit of understanding PK phenomena, both within the laboratory and in ‘real-world’ situations. To that extent, the researcher may herself be described as being a ‘labile’ person, in that she has the ability to adapt readily to change, a prerequisite for completing such a thesis project perhaps), and face new research challenges with vigour and determination. Then, at least, a more accurate demonstration of her being either psi-inhibitory or psi-conducive would be forthcoming..

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APPENDICES

APPENDIX A.1 Copies of the battery of measures used in the survey

A.1.1 The Emotional Creativity Inventory (ECI) (Averill, 1999)

Emotional Creativity Inventory (Averill, 1999)

This questionnaire contains 30 items concerning the way you think, feel, and react in a variety of situations, and your opinions on a variety of issues. Please read each statement carefully and indicate your response as to whether this applies to yourself by circling the appropriate number:

1= Strongly disagree (SD) when the statement does not apply to you.

2= Disagree (D) when you somewhat disagree with this statement.

3= Neutral (N) when you are 'average' or neutral on the issue or if you cannot decide if the statement applies to you.

4= Agree (A) when you somewhat agree with this statement.

5= Strongly Agree (SA) when you strongly agree that the statement applies to you.

Compared to the 'average person'	SD	D	N	A	SA
40. My emotional reactions are different and unique.	1	2	3	4	5
41. When I have strong emotional reactions, I search for reasons for my feelings.	1	2	3	4	5
42. I try to be honest about my emotional reactions, even when it causes me problems.	1	2	3	4	5
43. I respond well in situations that call for new and unusual emotional responses.	1	2	3	4	5
44. I believe that people should work on their emotional development as hard as they work on their intellectual development.	1	2	3	4	5
45. I can imagine myself being lonely, angry, and joyful, all at the same time.	1	2	3	4	5
46. I think about and try to understand my emotional reactions.	1	2	3	4	5
47. I sometimes experience feelings and emotions that cannot be easily described in ordinary language.	1	2	3	4	5
48. I am good at expressing my emotions.	1	2	3	4	5
49. I have felt combinations of emotions that other people probably have never experienced.	1	2	3	4	5
50. I am not particularly interested in the emotional aspects of my life.	1	2	3	4	5
51. The way I experience and express my emotions helps me in my relationships with others.	1	2	3	4	5
52. My emotions are almost always an authentic expression of my true thoughts and feelings.	1	2	3	4	5
53. I like music, dance, and paintings that arouse new and unusual emotional reactions.	1	2	3	4	5
54. I think about past emotional experiences to help me cope with current emotional problems.	1	2	3	4	5

(continued) The Emotional Creativity Inventory (ECI)

55.	I have emotional experiences that would be considered unusual or out of the ordinary.	1	2	3	4	5
56.	My emotions help me achieve my goals in life.	1	2	3	4	5
57.	When in emotional situations, I tend to respond in a unique manner.	1	2	3	4	5
58.	I like to imagine situations that call for unusual, uncommon, or unconventional emotional reactions.	1	2	3	4	5
59.	After an intensely emotional experience, I try to step back and examine my reactions objectively.	1	2	3	4	5
60.	When responding emotionally, I can be quite inventive and innovative.	1	2	3	4	5
61.	My outward emotional reactions accurately reflect my inner feelings.	1	2	3	4	5
62.	I would have to be a poet or novelist to describe the kinds of emotions I sometimes feel, they are so unique.	1	2	3	4	5
63.	I can experience a variety of different emotions at the same time.	1	2	3	4	5
64.	My emotions are a major source of meaning in my life; without them, my life would lack significance.	1	2	3	4	5
65.	I prefer movies and books that depict complex and improbable emotional situations.	1	2	3	4	5
66.	I pay attention to other people's emotions so that I can better understand my own feelings.	1	2	3	4	5
67.	The range and diversity of my emotional reactions sometimes exceed my ability to describe how I feel.	1	2	3	4	5
68.	I try to disguise and hide my emotions.	1	2	3	4	5
69.	I am able to experience a large number of different emotions.	1	2	3	4	5

A.1.2 The Creative Cognition Inventory (CCI) (Holt, Delanoy, & Roe, 2002)

The Creative Cognition Inventory (Holt, 2002)

To what extent are the following experiences important to being creative in your life?

Please respond from '1' indicating 'not at all important' to '5' indicating 'extremely important'

		not at all important				extremely important
15.	Making discoveries through trial and error	1	2	3	4	5
16.	Trusting hunches or instincts	1	2	3	4	5
17.	Ideas arising whilst dreaming	1	2	3	4	5
18.	Sudden moments of inspiration in waking life	1	2	3	4	5
19.	A sense of communicating with a deeper sense of self	1	2	3	4	5
20.	Loose, playful, unconstrained thinking	1	2	3	4	5
21.	Following your intuition	1	2	3	4	5
22.	Ideas arising as falling asleep or waking up	1	2	3	4	5
23.	Meditation	1	2	3	4	5
24.	Paying attention to visual imagery	1	2	3	4	5
25.	Experiences of losing track of time when involved in creative work	1	2	3	4	5
26.	Playing with ideas	1	2	3	4	5
27.	Luck, chance, 'fortunate accidents'	1	2	3	4	5
28.	The use of analogy	1	2	3	4	5
29.	A sense of purpose that seems to come from beyond the self	1	2	3	4	5
30.	Recombining existing elements in new ways	1	2	3	4	5
31.	A sense of channelling information	1	2	3	4	5
32.	Paying attention to auditory impressions	1	2	3	4	5
33.	Day dreaming	1	2	3	4	5
34.	The release of negative emotions	1	2	3	4	5
35.	Non-verbal modes of thinking	1	2	3	4	5
36.	Positive emotions, e.g. joy, excitement, euphoria	1	2	3	4	5
37.	Paying attention to bodily feelings	1	2	3	4	5
38.	A sense of communicating with something other	1	2	3	4	5
39.	A sense of being in tune with nature or the universe	1	2	3	4	5

A.1.3 *Goldberg's Openness to Experience Scale (OE) (Goldberg, 1999)*

Goldberg's Openness to experience scale

To what extent are the following statements an accurate description of you? Please respond from '0', indicating very inaccurate to '4' indicating very accurate. Please complete each item as quickly, accurately and honestly as possible. There are no right and wrong answers.

	Very inaccurate			Very accurate	
1. Am not interested in abstract ideas.	0	1	2	3	4
2. Tend to vote for liberal political candidates.	0	1	2	3	4
3. Am not interested in theoretical discussions.	0	1	2	3	4
4. Believe in the importance of art.	0	1	2	3	4
5. Enjoy hearing new ideas.	0	1	2	3	4
6. Have a vivid imagination.	0	1	2	3	4
7. Do not like art.	0	1	2	3	4
8. Do not like poetry.	0	1	2	3	4
9. Enjoy wild flights of fantasy.	0	1	2	3	4
10. Do not enjoy going to art museums.	0	1	2	3	4
11. Can say things beautifully.	0	1	2	3	4
12. Believe that too much tax money goes to support artists.	0	1	2	3	4
13. Have difficulty understanding abstract ideas.	0	1	2	3	4
14. Get excited by new ideas.	0	1	2	3	4
15. Tend to vote for conservative political candidates.	0	1	2	3	4
16. Have a rich vocabulary.	0	1	2	3	4
17. Enjoy thinking about things.	0	1	2	3	4
18. Rarely look for a deeper meaning in things.	0	1	2	3	4
19. Avoid philosophical discussions.	0	1	2	3	4
20. Carry the conversation to a higher level.	0	1	2	3	4

✂

A.1.4 *The Complex Partial Epileptic-like Signs Scale (CPES) of the Personal Philosophy Inventory (PPI), (Persinger & Makarec, 1987)*

Experiences Scale of the Personal Philosophy Inventory

104.	Sometimes an event will occur that has special significance for me only	No	Yes
105.	There have been times when I have stared at an object and it appeared to become larger and larger	No	Yes
106.	While sitting quietly I have had uplifting sensations as if I were driving quickly over a road	No	Yes
107.	When I have a tough decision to make, a sign will be given and I will know what to do	No	Yes
108.	When relaxed or just before falling asleep, I sometimes feel pleasant vibrations moving through my whole body	No	Yes
109.	Sometimes in the early morning hours between midnight and 4 a.m. my experiences are very meaningful	No	Yes
110.	I have had a vision	No	Yes
111.	I have heard an inner voice call my name	No	Yes
112.	At least once a month, I experience intense smells that do not have an obvious source	No	Yes
113.	I use 'hunches' more than simple learning to solve new problems	No	Yes
114.	I often feel as if things are not real	No	Yes
115.	When I walk up stairs, I sometimes note a strange smell from nowhere	No	Yes
116.	Once, in a crowded area, I suddenly could not recognise where I was	No	Yes
117.	I have had experiences when I felt as if I were somewhere else	No	Yes
118.	I have dreams of floating or flying through the air at least once a year	No	Yes
119.	At least once in my life, just before falling down I have had the intense sensation of a smell from childhood	No	Yes

A.1.5 *Mood Lability (MOOD), (Akiskal, et al., 1995)*

1. My mood often changes from happiness to sadness without my knowing why

Not at all			Undecided			Very much so

2. I have frequent ups and downs in mood without apparent cause

Not at all			Undecided			Very much so

3. In general I consider myself to be a very happy person

Not at all			Undecided			Very much so

A.1.6 *The Anomalous Experiences Inventory (AEI), (Gallagher, Kumar, & Pekala, 1994).*

Anomalous Experiences		
<p>This section explores individual anomalous or paranormal experiences, beliefs and abilities. Please rate your responses as honestly as possible - there are no right or wrong answers. At the end of the section will be a box for you to write down any personal anomalous experiences you wish to record. All information will be kept completely confidential.</p>		
Anomalous Experiences	True	False
I often have deja vu experiences	<input type="radio"/>	<input type="radio"/>
I often seem to become aware of events before they happen	<input type="radio"/>	<input type="radio"/>
I often have psychic experiences (e.g. reading other peoples' minds etc.)	<input type="radio"/>	<input type="radio"/>
There have been events that I dreamed about before the event occurred	<input type="radio"/>	<input type="radio"/>
I have attended seances	<input type="radio"/>	<input type="radio"/>
I have had a near death experience (experiencing a tunnel, light etc.)	<input type="radio"/>	<input type="radio"/>
I have experienced other planes of existence beyond the physical	<input type="radio"/>	<input type="radio"/>
I often know what others are feeling or thinking without them telling me	<input type="radio"/>	<input type="radio"/>
At times, my consciousness feels expanded beyond my body	<input type="radio"/>	<input type="radio"/>
I have experienced my physical body or objects floating in the air (levitation)	<input type="radio"/>	<input type="radio"/>
I have had a psychic experience	<input type="radio"/>	<input type="radio"/>
I use a ouija board on a regular basis (to contact spirits)	<input type="radio"/>	<input type="radio"/>
I have experienced objects appearing or disappearing around me (materialisation or dematerialisation)	<input type="radio"/>	<input type="radio"/>
I have had a mystical experience	<input type="radio"/>	<input type="radio"/>
I have had an out-of-body experience	<input type="radio"/>	<input type="radio"/>
I have had memories of a past life	<input type="radio"/>	<input type="radio"/>
I have communicated with the dead	<input type="radio"/>	<input type="radio"/>
I have seen a ghost or apparition	<input type="radio"/>	<input type="radio"/>
I have had an experience of time standing still	<input type="radio"/>	<input type="radio"/>
At times, I have felt possessed by an outside force	<input type="radio"/>	<input type="radio"/>
I have experienced or met an extraterrestrial	<input type="radio"/>	<input type="radio"/>
I visit fortune tellers, palm readers, tarot card readers or astrologers	<input type="radio"/>	<input type="radio"/>
My bizarre predictions have often come true	<input type="radio"/>	<input type="radio"/>
My horoscope is fairly accurate	<input type="radio"/>	<input type="radio"/>
I have had waking visions of an event which subsequently occurred	<input type="radio"/>	<input type="radio"/>
I have had a psychic or mystical experience which scared me to death	<input type="radio"/>	<input type="radio"/>
I have seen elves, fairies and other types of little people	<input type="radio"/>	<input type="radio"/>
I have seen a UFO (Unidentified Flying Object)	<input type="radio"/>	<input type="radio"/>
I practice witchcraft or sorcery	<input type="radio"/>	<input type="radio"/>
I can influence or change an event by concentrating on that event	<input type="radio"/>	<input type="radio"/>
I am able to move or influence objects with the force of my mind alone	<input type="radio"/>	<input type="radio"/>
I can alter my state of consciousness at will	<input type="radio"/>	<input type="radio"/>
I am able to communicate with supernatural forces	<input type="radio"/>	<input type="radio"/>

(continued) The Anomalous Experiences Inventory (AEI)

I have spoken in 'tongues' (language that cannot be understood by the speaker, supposedly given by God)

☐☐

I have become aware of events that took place far away (clairvoyance)

☐☐

I can heal a sick or injured person with healing energy from my mind and body

☐☐

I am able to see auras surrounding peoples' bodies

☐☐

I have tried channeling (made contact with spirits) or have been a medium

☐☐

I can use dowsing to find underground water, minerals or other objects

☐☐

I can leave my body and return to it will

☐☐

I can experience others' feelings as they experience them

☐☐

i am able to communicate with the dead

☐☐

I can control my own dreams

☐☐

I am psychic

☐☐

A.1.7 *The Rhine Psychokinesis Questionnaire (RPQ) (Simmonds-Moore, Rhine Feather, & Gadd, 2010)*

Psychokinetic (mind over matter) Experiences.	Strongly agree	Agree	Neutral	Disagree	Strongly Disagree
I have experienced anomalous physical phenomena	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have never experienced anomalous physical phenomena	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am unable to wear a wrist watch	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I am "wired" differently to other people	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anomalous physical effects are associated with having too much energy in my body/nervous system	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anomalous physical effects have occurred when I am extremely angry, stressed, or upset	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anomalous physical effects have taken place when I am in a relaxed or meditative state	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
My wrist watch rarely malfunctions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Computers seem to malfunction or "crash" when I am stressed	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Human beings cannot affect electronic equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Members of my family have experienced problems wearing watches	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am sensitive to electrical or magnetic equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am not overly sensitive to electrical equipment	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Other people have noticed that electrical equipment often breaks, switches on or off, or malfunctions in my presence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I frequently experience problems with my mobile phone	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When I walk or drive along the street, the street lights go on or off as I pass them	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anomalous physical events can be explained as chance or coincidental events	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anomalous physical events have happened when I have experienced extreme emotions	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anomalous physical experiences indicate that life is more interconnected than it might seem to be	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can affect physical objects at will	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have intentionally affected the movement of a physical object with another person	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I can affect the weather at will	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I cannot affect physical or external objects at will	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
When a person is suffering, I have experienced the palms of my hands going red and warm	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have successfully undertaken a distant healing practice	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I am a healer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I feel that I could become a healer	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Electrical equipment has malfunctioned due to a discarnate influence	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anomalous physical events have a normal explanation	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An anomalous physical event occurred in response to my desire or question (to the universe/god/a discarnate entity)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anomalous physical events take place due to the intervention of discarnate spirits in the world of the living	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An anomalous physical event has conveyed a message to me from a discarnate source	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have observed an object falling or moving strangely at the time as the death of a loved one	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I have experienced "apports" (objects have anomalously appeared or disappeared)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anomalous physical phenomena reflect the actions of an external	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

(continued) The Rhine Psychokinesis Questionnaire (RPQ)

	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
(perhaps discarnate) entity					
Anomalous physical phenomena can reflect messages from the universe	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
An anomalous physical event has conveyed a meaningful message to me	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Anomalous physical phenomena have occurred to direct my attention to important things in my life	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Please write down any personal anomalous experiences.					
<div style="border: 1px solid black; height: 150px; width: 100%;"></div>					

APPENDIX A.2 Frequency distribution histograms of the survey measures

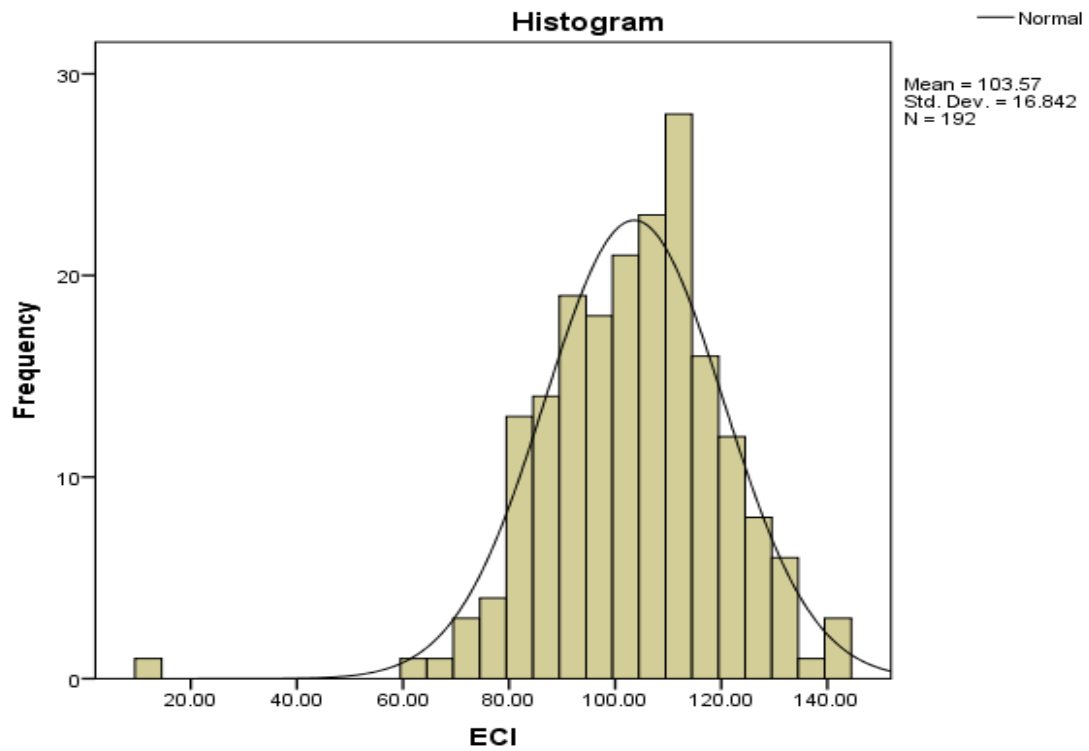


Figure 1.1. *Emotional Creativity Inventory scores*

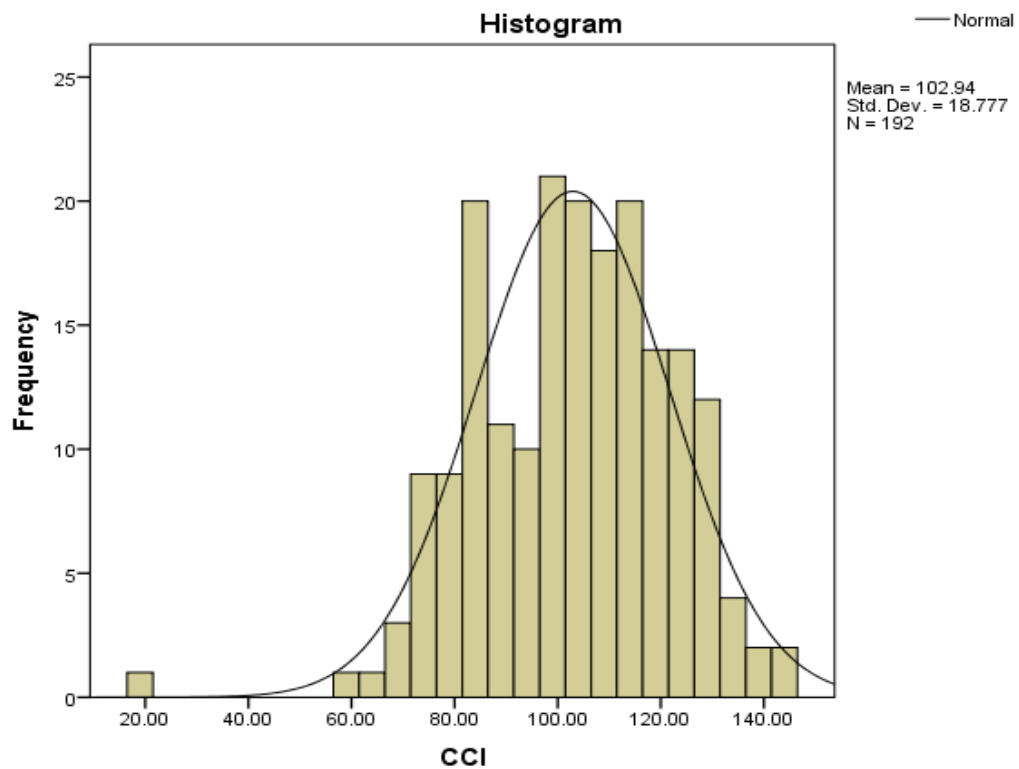


Figure 1.2 *Creative Cognition Inventory scores*

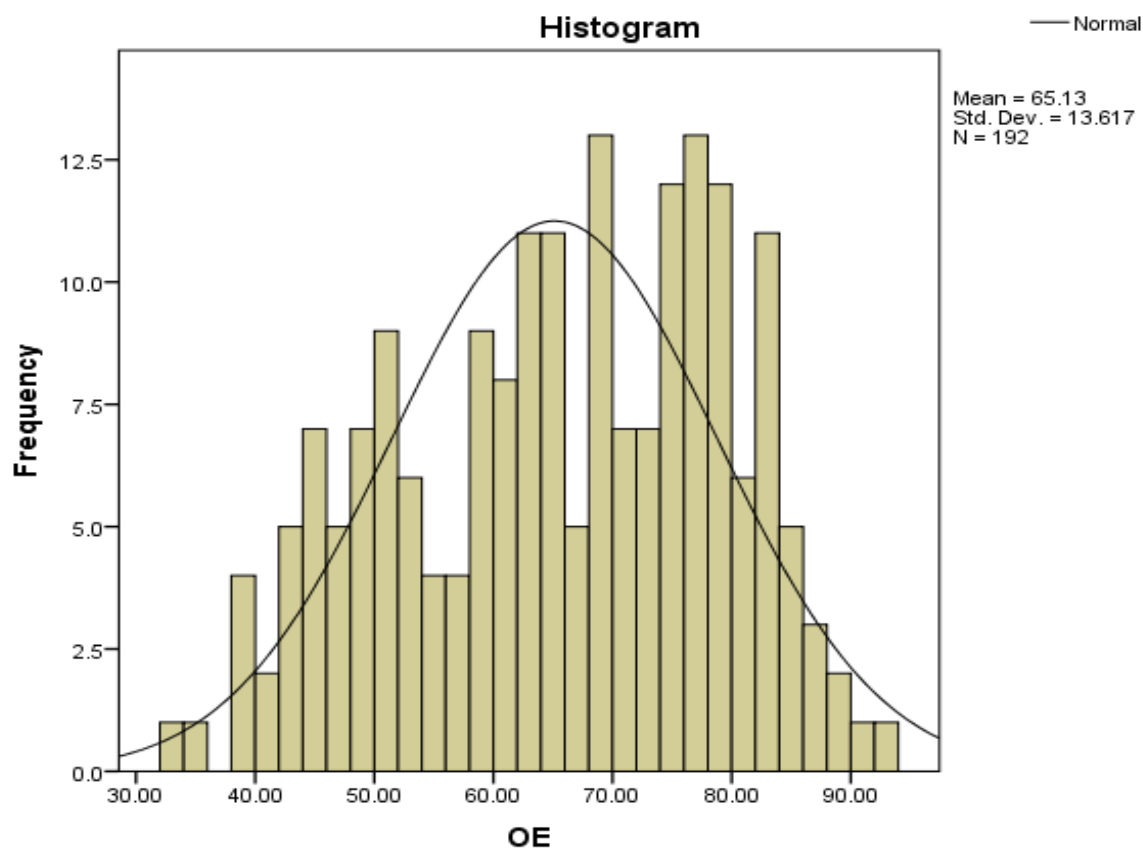


Figure 1.3 *Openness to Experience scores*

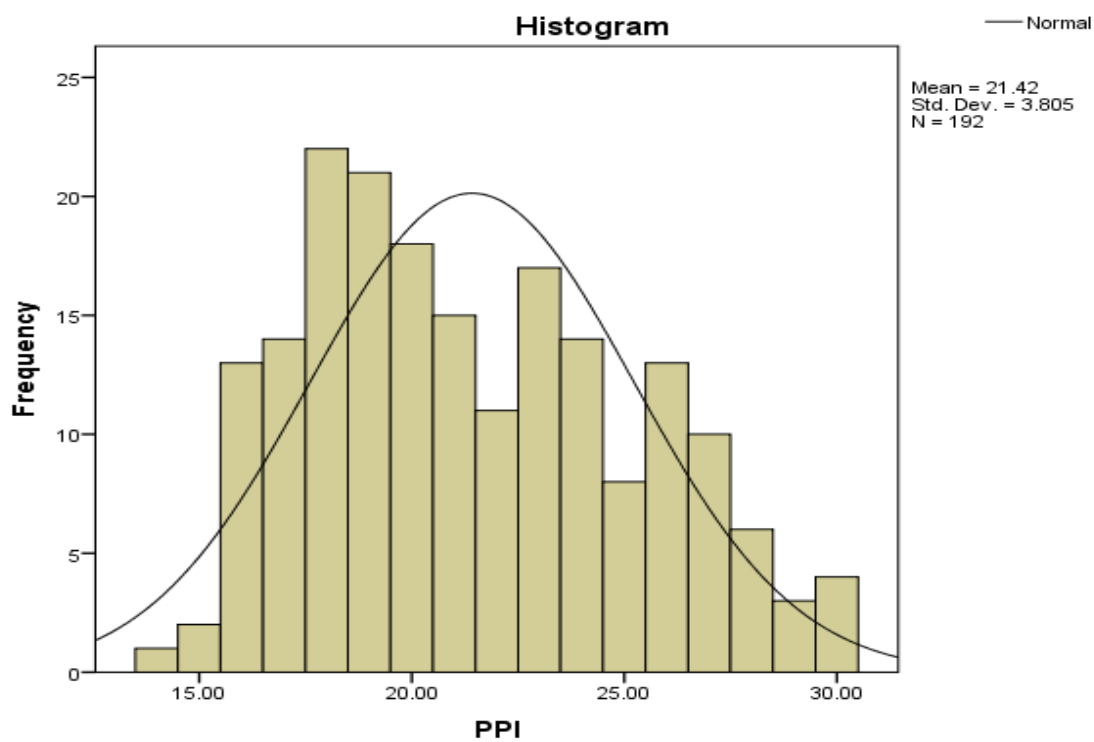
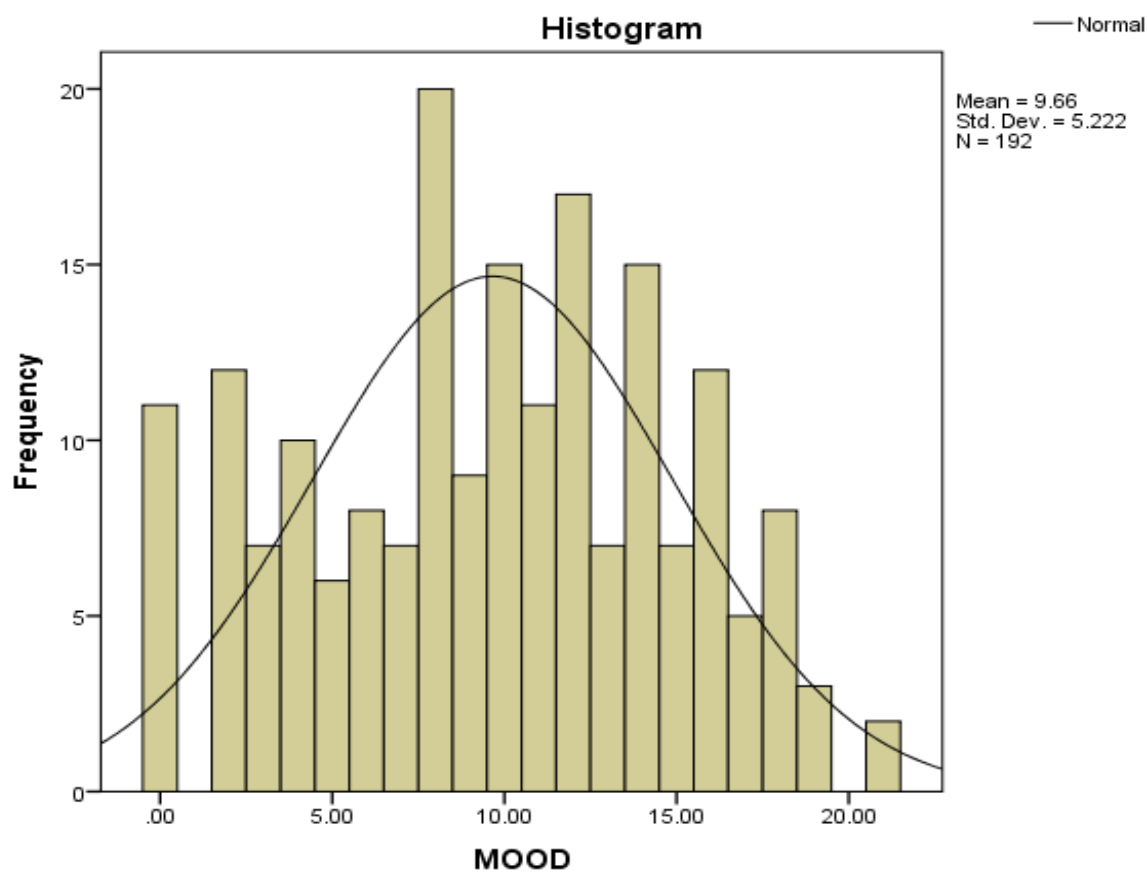
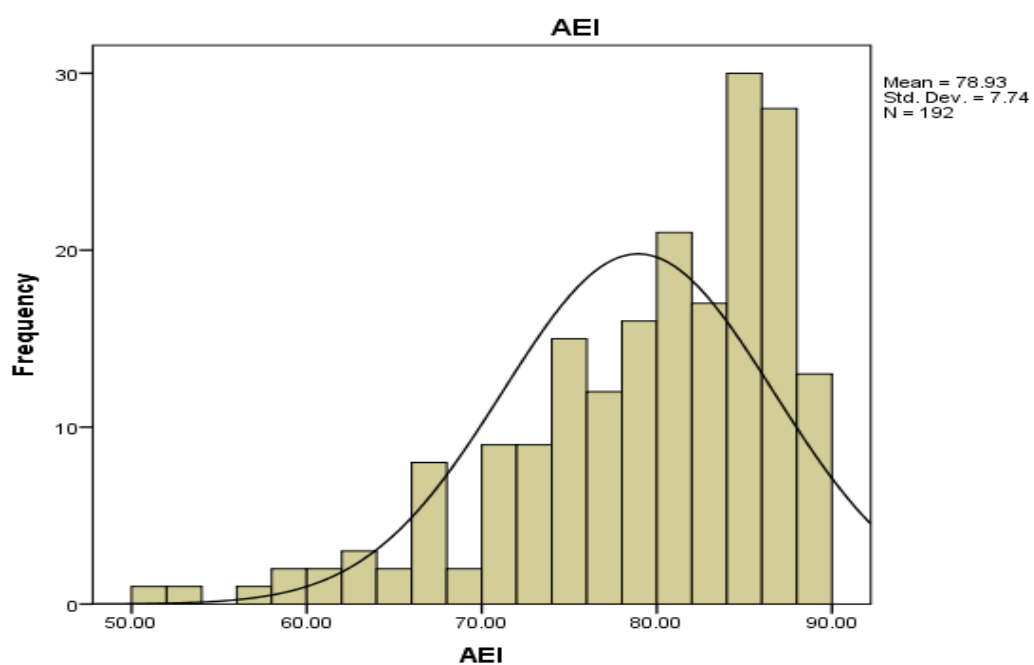


Figure 1.4 *Personal Philosophy Inventory scores*

Figure 1.5 *Mood scores*Figure 1.6 *Anomalous Experience Inventory scores*

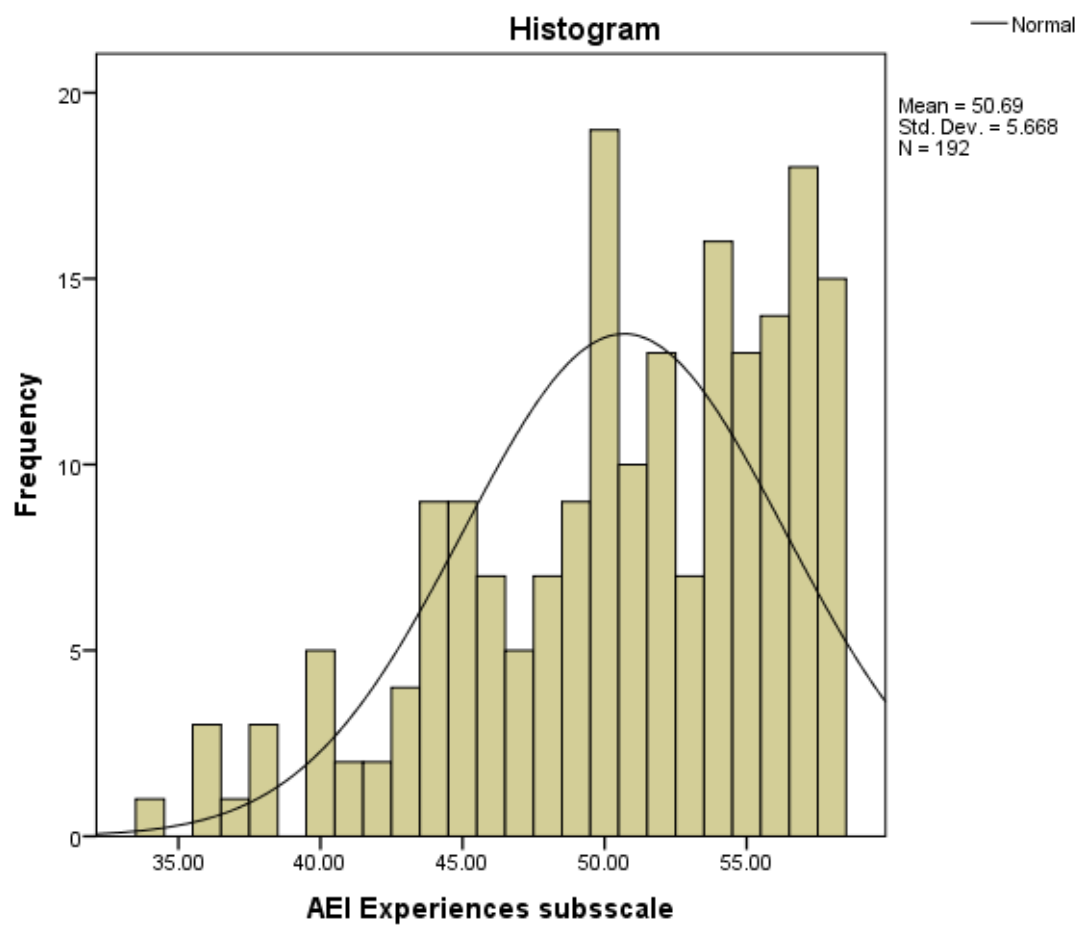


Figure 1.7 AEI subscale of Anomalous Experiences

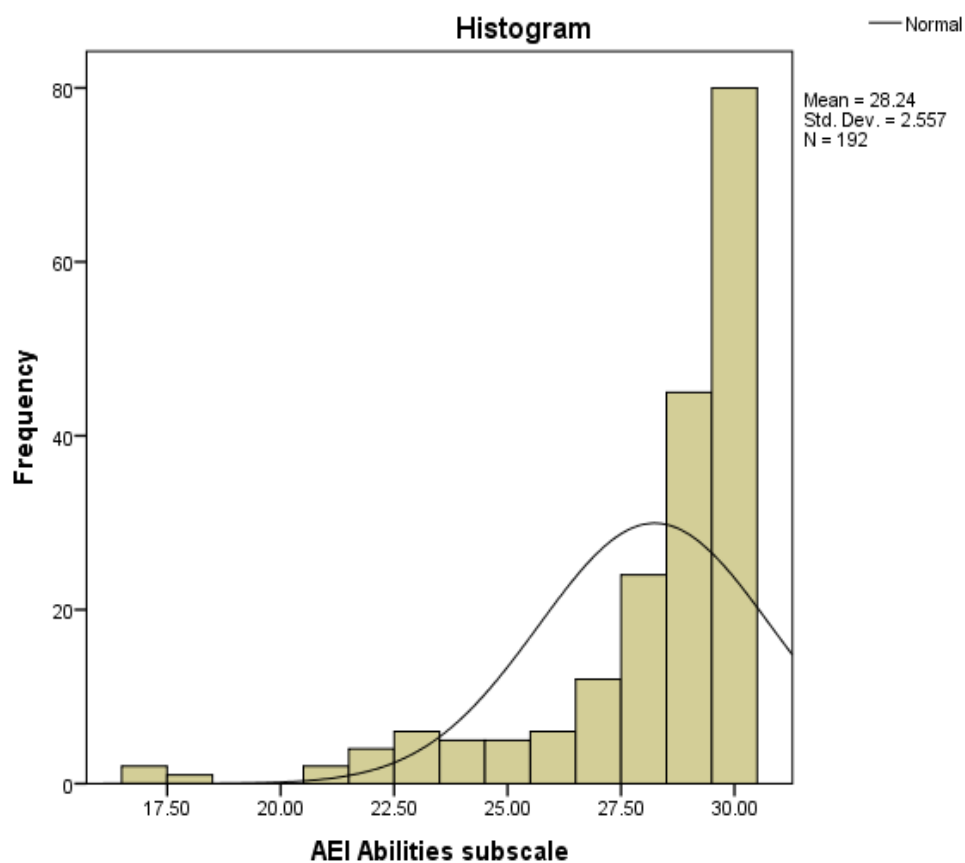


Figure 1.8 *AEI subscale of Anomalous Abilities*

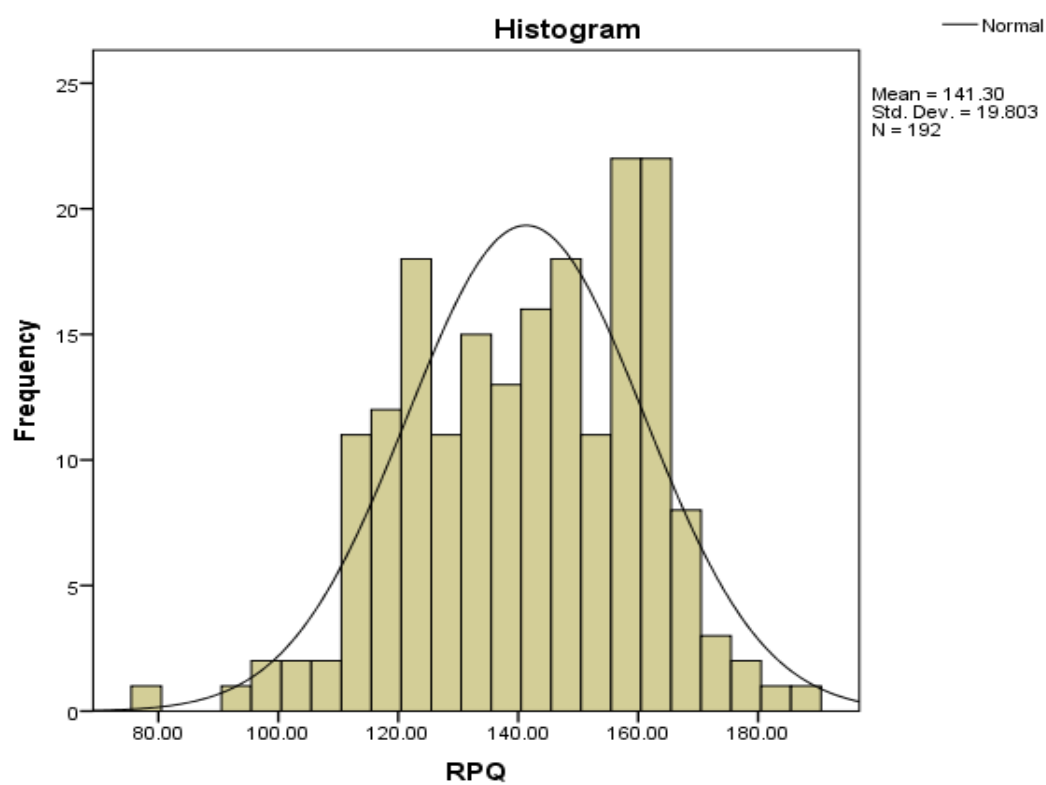
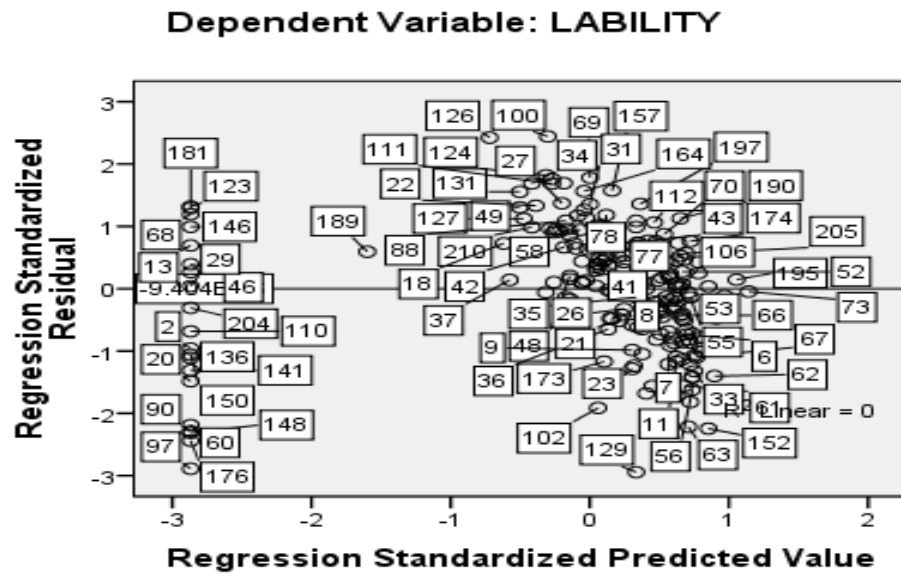


Figure 1.9 *Rhine Psychokinesis Questionnaire scores*

Figure 1.10 Scatterplot illustrating individual outlier scores for the Liability Scale



APPENDIX A.3 *Frequency distribution histograms for the Liability Scale and the five identified components*

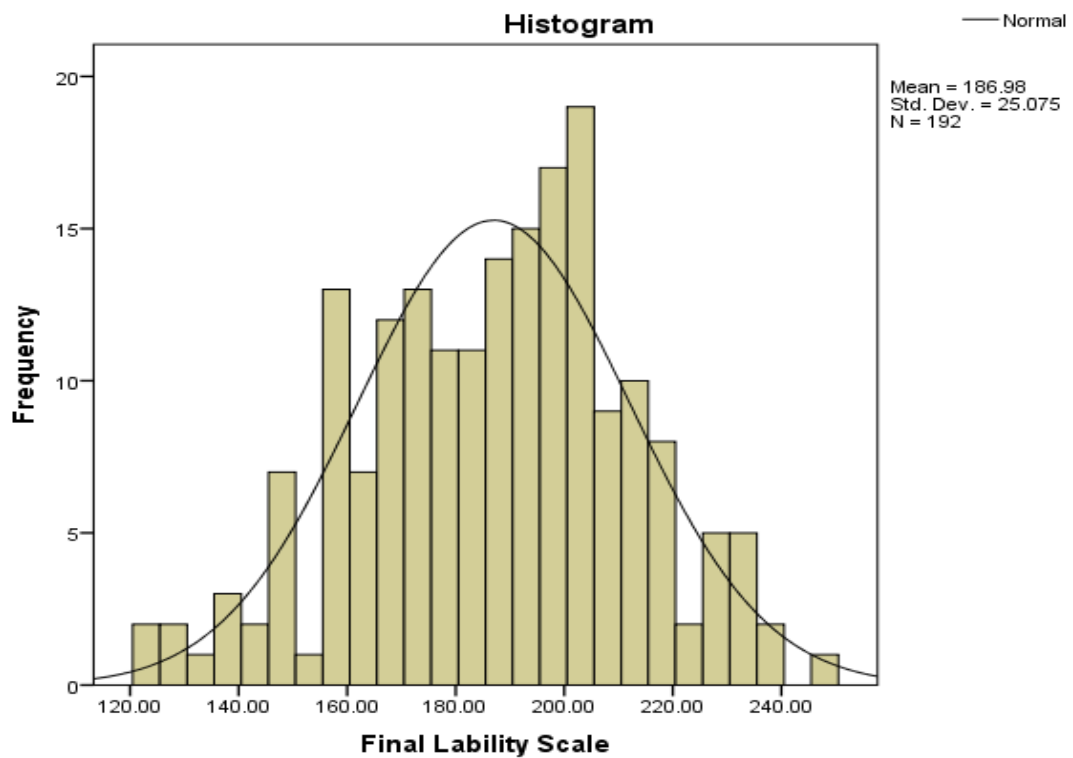


Figure 1.11 *Liability Scale scores*

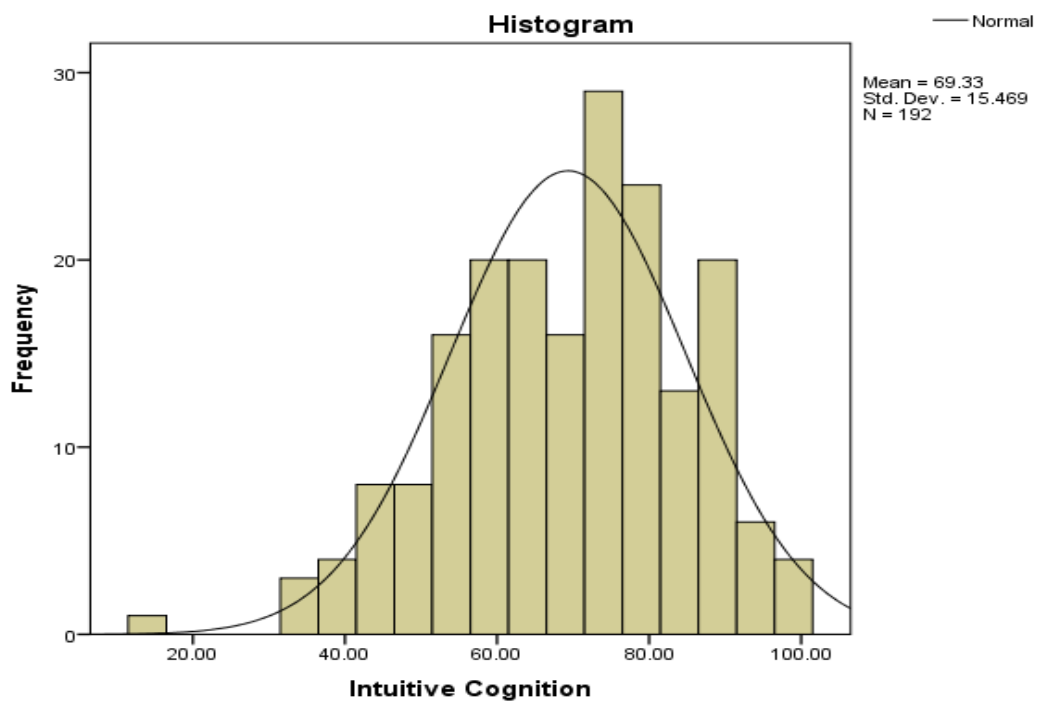


Figure 1.12 *Intuitive Cognition subscale scores*

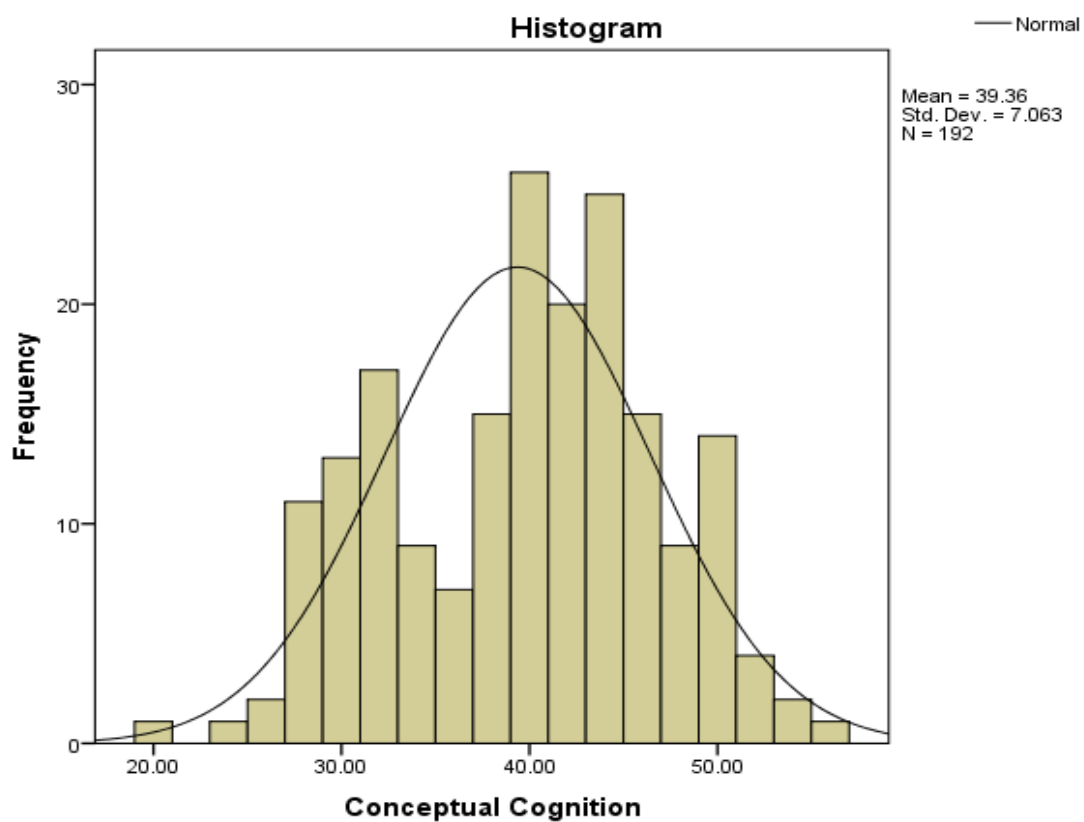


Figure 1.13 *Conceptual Cognition subscale scores*

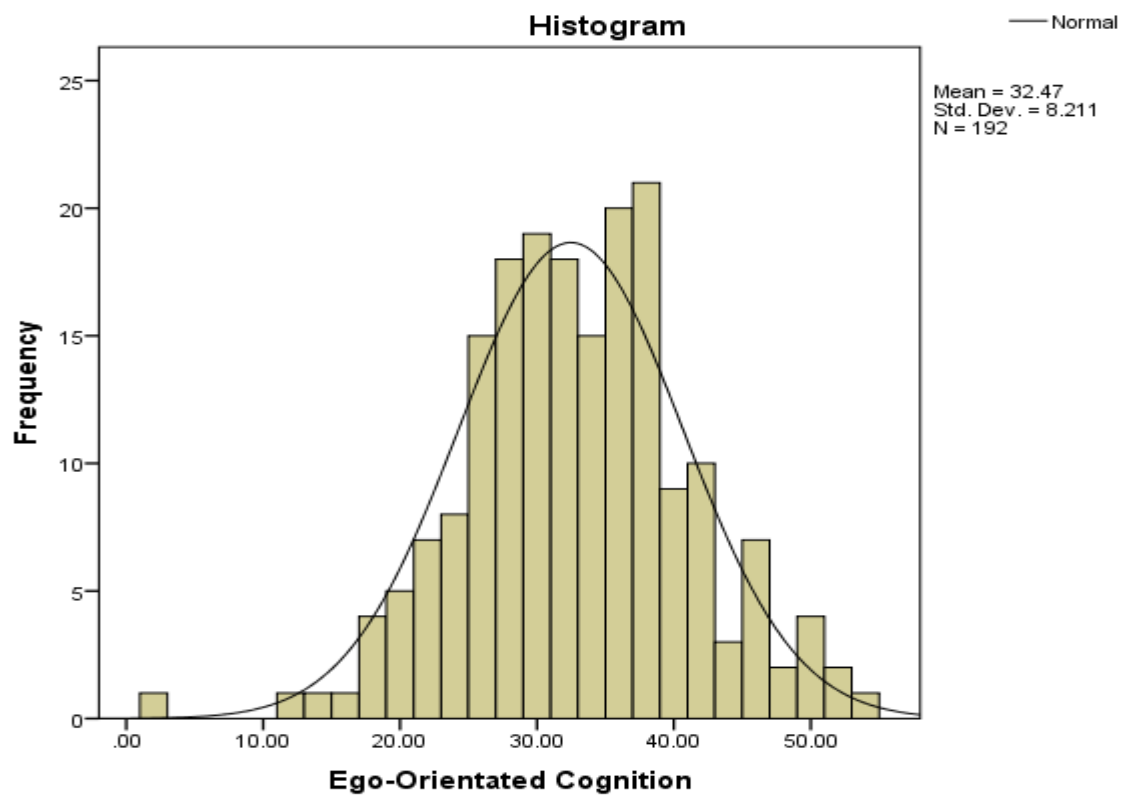


Figure 1.14 *Ego-Orientated Cognition subscale score*

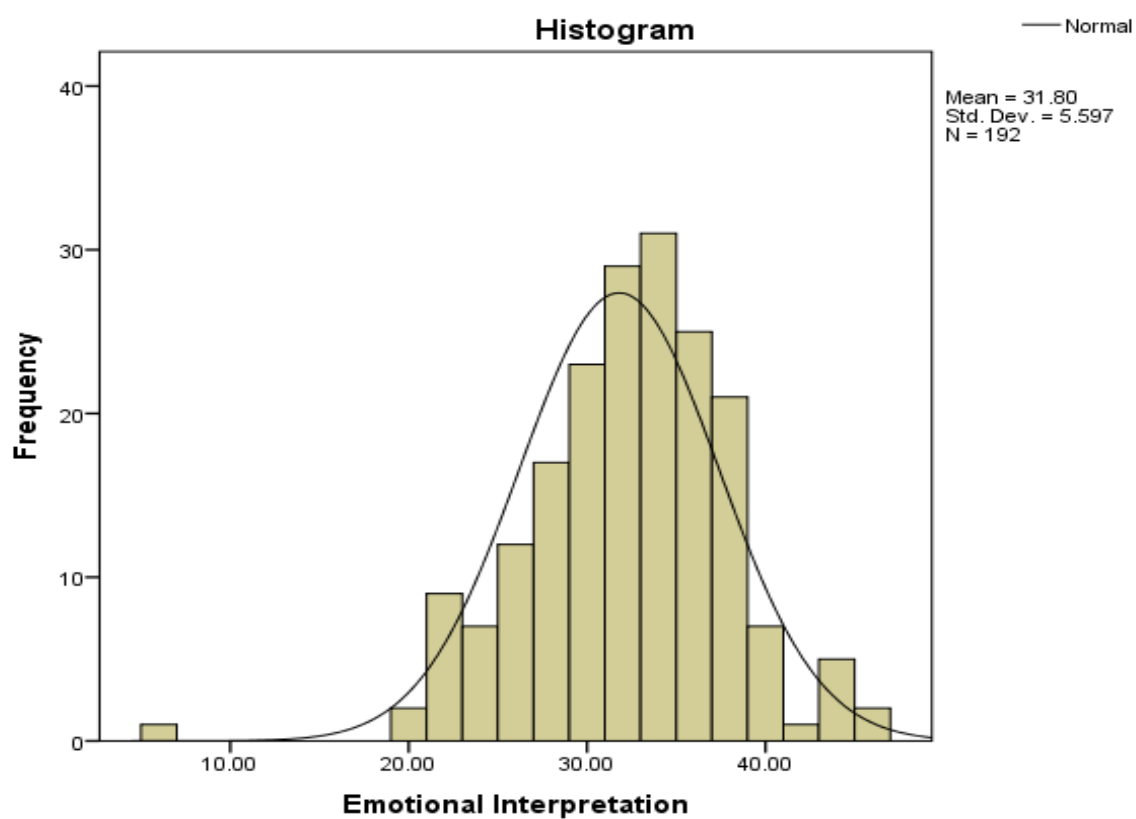


Figure 1.15 *Emotional Interpretation* subscale scores

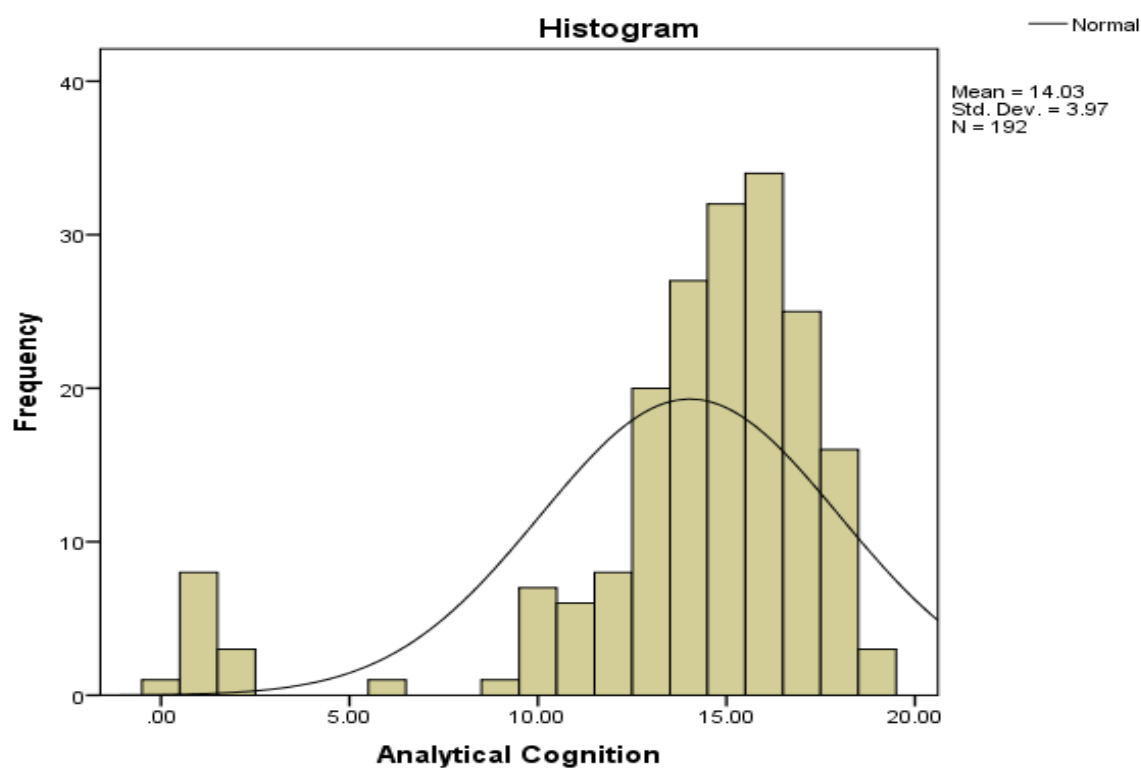


Figure 1.16 *Analytical Cognition* subscale scores

APPENDIX A.4 *Differences between genders for the Liability Scale, the Anomalous Experience Inventory (AEI) and the Rhine Psychokinesis Questionnaire (RPQ)*

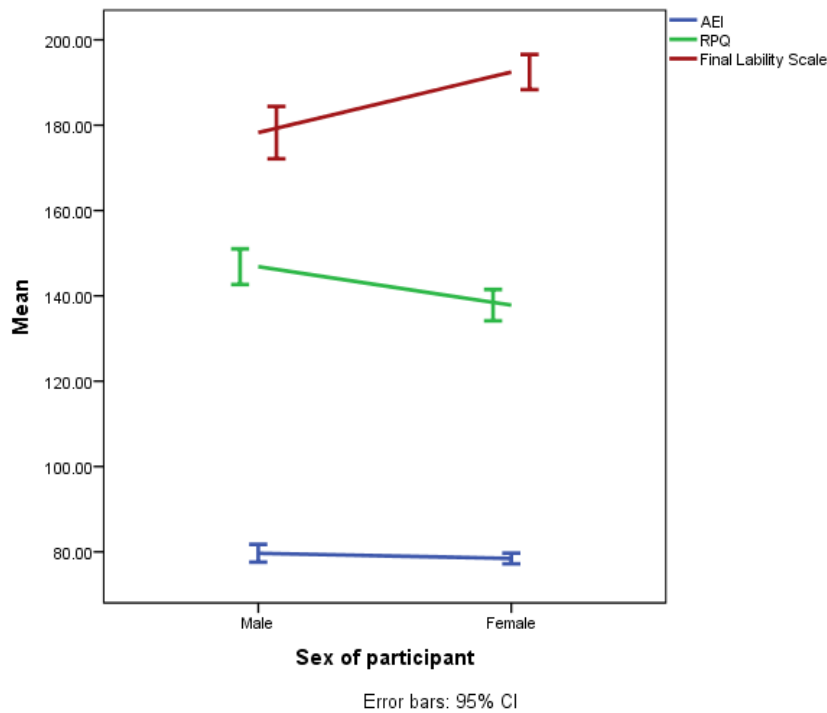


Figure 1.17 Multiple line graph with 95% confidence error bars representing the difference between males and females for the Liability Scale and the Anomalous Experience Inventory (AEI) and the Rhine Psychokinesis Questionnaire (RPQ)

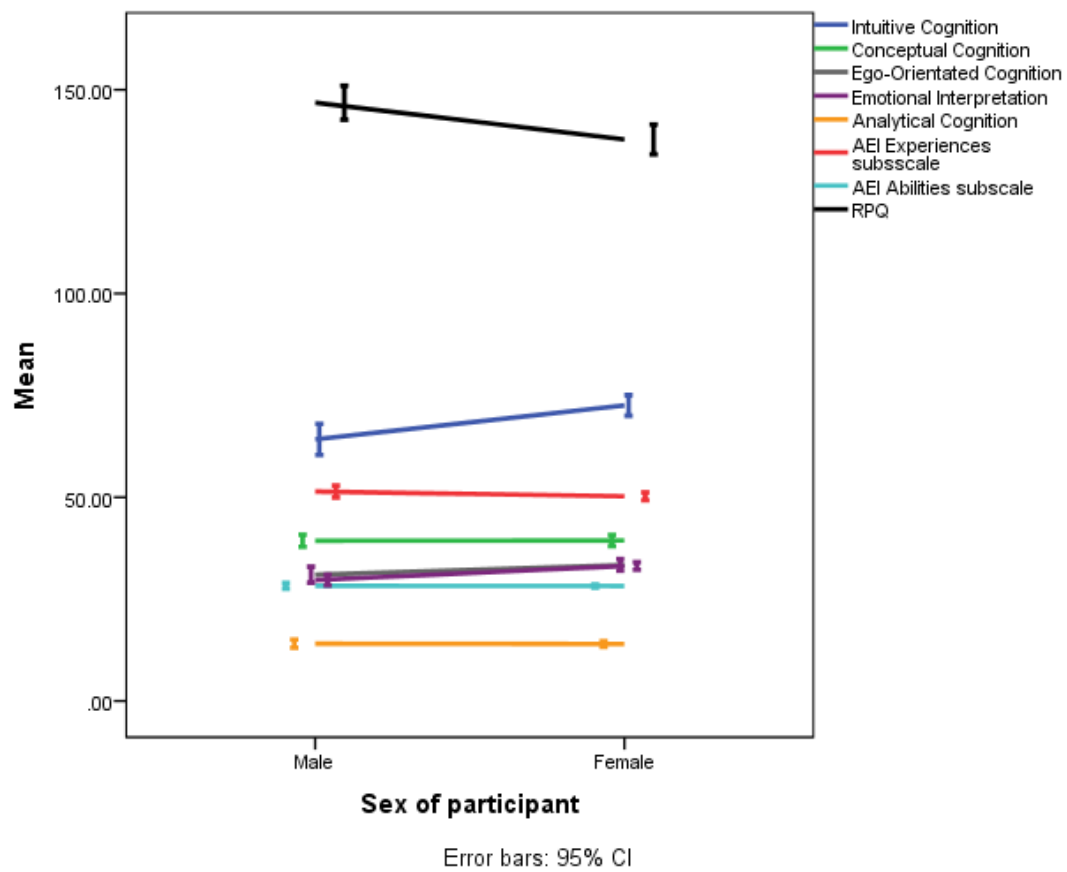


Figure 1.18 Multiple line graph with 95% confidence interval error bars representing the difference between males and females for the lability factors of IC, EC, EGO, EI and AC, the subscales of AEIEX and AEIAB and the RPQ

APPENDIX A.5 Materials for the PK-RNG experiments

<p>64</p> <p><i>Ch'ien (The Creative)</i></p> <p><i>You can be successful but only if you show perseverance. You need to know your limitations and not act rashly.</i></p>	<p>1</p> <p><i>K'un (The Receptive).</i></p> <p><i>You may feel you've taken a wrong direction recently, but others will be able to give you guidance that will lead to good fortune.</i></p>	<p>39</p> <p><i>Ku (Reparation of the Spoilt)</i></p> <p><i>Family responsibilities can feel like a burden sometimes; it may seem like these are holding you back, but this is only temporary and will make you stronger.</i></p>	<p>35</p> <p><i>Meng (Youth)</i></p> <p><i>Some questions do not have definite answers; it is healthy to keep searching but expect guidance and not the full result.</i></p>
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Figure 1.19 Examples of four I Ching hexagram tablet divinations

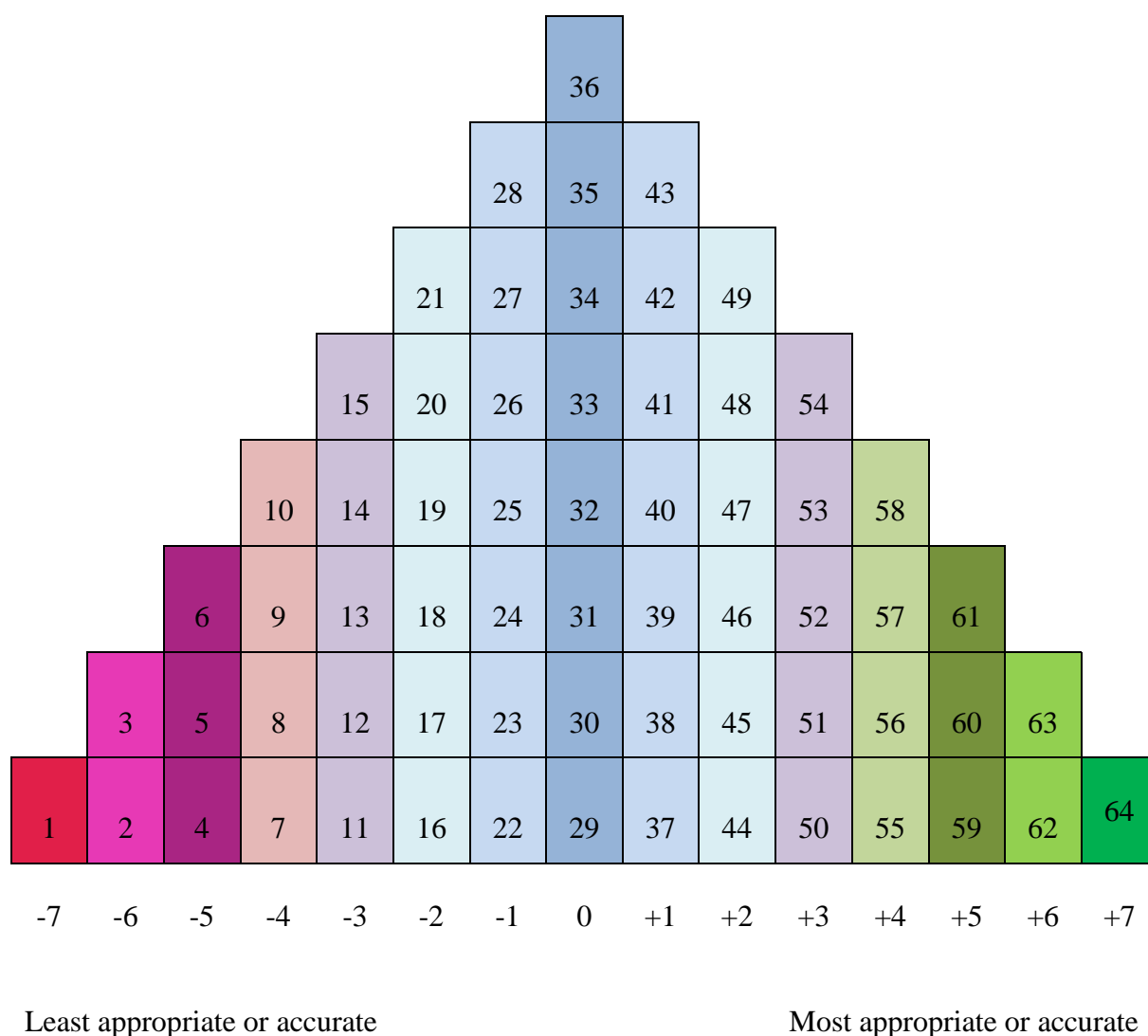
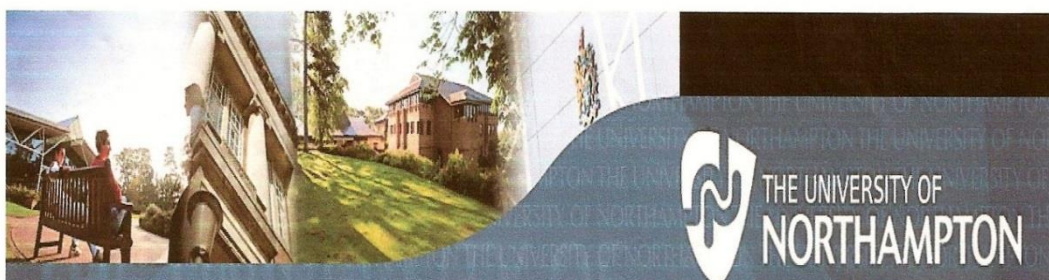


Figure 1.20 *Example of the I Ching task Q sort grid showing the ratings scale (-7 to +7) for the 64 possible divinations. The individual 64 divination tablets (see Figure 1.19) would be placed on each square in order to gauge personal relevancy to the question posed in the I Ching reading.*

APPENDIX A.6 Standardized consent and debriefing forms for the three PK-RNG experiments



CONSENT FORM

Centre for the Study of Anomalous Psychological Processes (CSAPP)
Psychology Division
University of Northampton
Individual differences in relation to the I Ching

What is the study about?

The study is investigating the relationship between the outcome of the ancient Chinese divination method of the I Ching and individual psychological and physiological characteristics.

What is the I Ching?

Various forms of the I Ching have been used as an oracle within Chinese culture for centuries and primarily consist of sixty-four hexagrams lots – traditionally bamboo sticks, yarrow stalks or coins. After posing a question an individual throws the lots and the randomly formed pattern is interpreted for the divination.

Who are the participants?

The participants consist of voluntary adults from the general population and include the student body of the University of Northampton. It is required that participants must not be taking any medication that may act as stimulants.

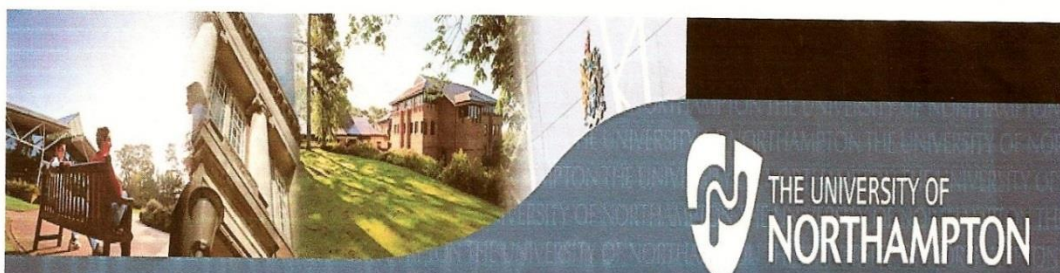
What does the study involve?

You will be required to complete 2 questionnaires regarding psychological states and traits and which will include the basic demographic details of age and gender.
You will be asked to rate I Ching hexagrams for relevancy to a personal confidential question.
For the experiment you will consult the I Ching using a computer program.
Heart rate (HR) will also be measured throughout the experiment to assess physiological arousal.
The experiment is non-intrusive and should not take longer than 15 minutes to complete.

What will I be asked to do for the experiment?

You will be asked to think about a personal question to pose to the I Ching for a reading and which is not to be revealed to the investigator.
Keeping this question in mind, you will then be asked in your own time to place the sixty-four I Ching interpretation cards by hand in applicable order of relevance on the given grid.
Once you are satisfied with the placing of the cards, the investigator will record their position.
You will then be introduced to automated I Ching computer program and keeping the same personal question in mind cast the generated lots for a further reading.

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**THE UNIVERSITY OF
NORTHAMPTON**

What else do I need to know?

The principal investigator will be available throughout the experiment to answer any questions or concerns.

Can I withdraw from the study at any time?

Yes. You retain the right to withdraw at any time, even once the study has begun, and you do not have to provide a reason for doing so. Any data collected from you will then be disregarded and not used within the study.

Will anyone know my identity?

No. Although a signature is required on the consent form, the identity of the participant remains anonymous to all but the investigator and will not be printed in this study or reproduced. A substitute code for each participant will be used instead on all electronic and paper records.

I declare that I do not take any medication that may effect the outcome of the physiological measures and understand the nature and procedure of the study and my right to withdraw at any point .

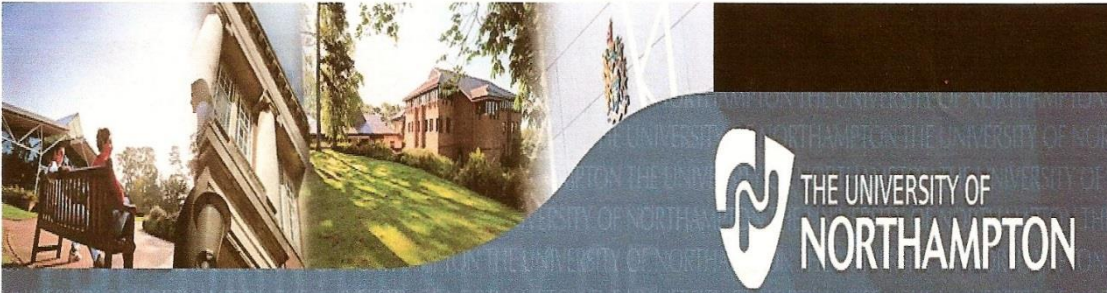
Signature of participant _____

Signature of investigator _____

Date _____

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Standardised debriefing form for the I Ching studies



DEBRIEFING FORM

Centre for the Study of Anomalous Psychological Processes (CSAPP)
Psychology Division
University of Northampton
Individual differences in relation to the I Ching

Thank you for agreeing to participate in this study!

The experiment you have just undertaken has been investigating the relationship between individual differences and psychokinetic effects using an I Ching divination task..

You were initially asked to complete 2 questionnaires investigating individual psychological lability (the ease of change) and state anxiety - The Lability Scale and The Perceived Stress Scale (Cohen et al., 1983).

Physiological measures of skin conductance (SC) and Heart Rate (HR) were also taken during the study – an initial 5 minutes to establish a normal individual level and then a further measurement throughout the I Ching task to establish any changes in physiological arousal levels.

At the beginning of the experiment you were asked to think of an appropriate question to ask the I Ching oracle. This question was not to be revealed to the researcher, but to kept in mind throughout the experiment.

You were then given a Q-sort grid shaped like a pyramid and asked to rate the separate 64 I Ching divination hexagrams. Once satisfied with your choices these ratings were then recorded by the researcher.

You were then asked to turn your attention to generating an I Ching reading on a computer program using the question you had thought of earlier.

So what does this all mean?

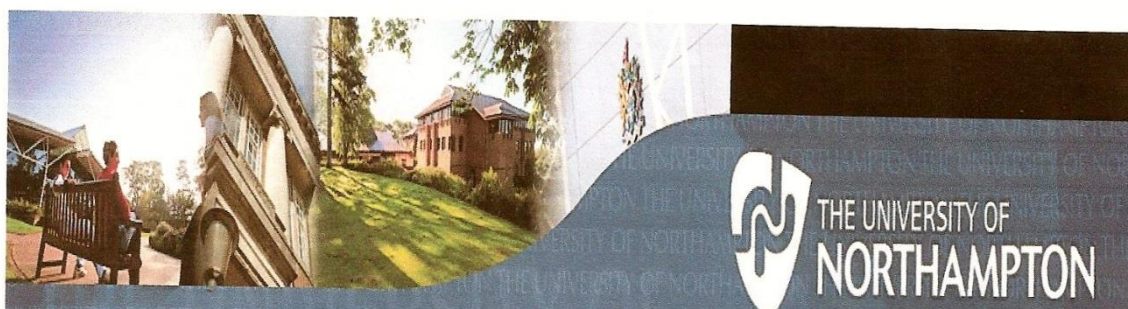
Well, as well as exploring the relationship between lability, state anxiety and physiological arousal, the study was also investigating whether there was also a relationship between these individual differences and psychokinetic (PK) effects!

But, what is PK?

In parapsychology, PK is the alleged ability to exert an influence over the external environment and without the mediation of any other known process – basically, mind over matter.

Trying to study PK in a real-world environment is very problematic, so researchers attempt to study PK effects in a controlled laboratory environment. One of the simplest ways to do this is by observing if there are any patterns in a random system – such as a random number generator (RNG) . The RNG used in this case was connected to the computer generated I Ching. When you ran the program it used either a low, moderate or high lability RNG to generate the reading.

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But what is lability?

Lability is the opposite of stability – it is a system's ability to change or be flexible. This lability is possible within human individual differences such as psychological states and traits and physiological processes.

In parapsychology, there is a theory that PK effects occur when there is an interaction between varying levels of lability – high and low. This may mean that PK effects may manifest between a person with low levels of lability and another system such as an RNG with high levels and vice versa.

But, what was my role in all of this?

The reason you completed the initial Lability Scale was for the researcher to assess your individual lability level. Then, following your rating of the I Ching hexagrams in relevance to your personal question, the researcher is then able to assess if there are any significant PK effects by observing the accuracy of these ratings against the low, moderate or high lability RNG I Ching reading generated by the computer program.

But, what was the physiological measure for?

Your heart rate (HR) was measured to observe any unconscious physiological arousal during the I Ching task and to explore how it relates to results from the Perceived Stress Scale. This is because there is ongoing debate as to whether an optimal level of physiological arousal can impact on PK effects.

And finally...

Your responses on the questionnaires and the results of your experimental session will be kept completely confidential, as a code will be assigned to your details.

On completion, the project will be written up for formal publication and conference presentation – if you would like to know the eventual outcome, feel free to contact me.

May I also ask you not to discuss the nature and background of the project with potential participants whilst it is still running? This is only because knowledge of the experiment may adversely effect the results.

If you have any queries regarding the project, please contact me at: sophie.drennan@northampton.ac.uk or the project's Director of Studies Dr. Chris A. Roe at: Chris.Roe@northampton.ac.uk

Thank you!

Transforming lives, inspiring change

APPENDIX A.7 Rotated factor loadings for the Liability Scale

Item	Component				
	Factor 1 Intuitive Cognition 26 Items ($\alpha = .92$)	Factor 2 Conceptual Cognition 18 Items ($\alpha = .42$)	Factor 3 Ego-Orientated Cognition 12 Items ($\alpha = .78$)	Factor 4 Emotional Interpretation 10 Items ($\alpha = .71$)	Factor 5 Analytical Cognition 5 Items ($\alpha = .79$)
CCI_28 A sense of communicating with something other	.75				
CCI_7 A sense of communicating with a deeper self	.72				
CCI_18 A sense of purpose that seems to come from beyond the self	.70				
CCI_22 Paying attention to auditory impressions	.69				
CCI_21 A sense of channelling information	.69				
CCI_26 Positive emotions, e.g. joy, excitement, euphoria	.67				
CCI_27 Paying attention to bodily feelings	.66				
CCI_25 Non-verbal modes of thinking	.64				
CCI_29 A sense of being in tune with nature or the universe	.631			.338	
CCI_13 Paying attention to visual imagery	.62				
CCI_12 Meditation	.62				
CCI_3 Ideas arising whilst dreaming	.62				
CCI_11 Ideas arising as falling asleep or waking up	.59				
CCI_14 Experiences of losing track of time when involved in creative work	.576	.322			
CCI_16 Luck, chance, 'fortunate accidents'	.57				
CCI_10 Following your intuition	.55				
CCI_24 The release of negative emotions	.540			.303	
PPI_4 When I have a tough decision to make a sign will be given and I will know what to do	.53				
CCI_23 Day dreaming	.50				
CCI_2 Trusting hunches or instincts	.499			.354	
PPI_1 Sometimes an event will occur that has a special significance for me only	.49				
CCI_9 Loose, playful unconstrained thinking	.460	.436			
PPI_7 I have had a vision	.45				
PPI_6 Sometimes in the early morning hours between midnight and 4 a.m. my experiences are very meaningful	.43				
PPI_9 At least once a month, I experience intense smells that do not have an obvious source	.39				
PPI_10 I use 'hunches' more than simple learning to solve a new problem	.38				
PPI_12 When I walk up stairs, I sometimes note a strange smell from somewhere else	.36				
CCI_17 The use of analogy	.34				
PPI_5 When relaxed or just before falling asleep, I sometimes feel pleasant vibrations moving through my whole body	.33				
OE_6 Have a vivid imagination	.33				
PPI_3 Whilst sitting quietly I have had uplifting sensations as if I were driving quickly over a road	.33				

PPI_8 <i>Do not like poetry</i>					
CCI_1 <i>Making discoveries through trial and error</i>					
OE_10 <i>Do not enjoy going to art museums</i>		-.63			
OE_7 <i>Do not like art</i>		-.62			
OE_5 <i>Enjoy hearing new ideas</i>		.60			
OE_4	-.332	.597			
OE_12 <i>Believe that too much tax money goes to support artists</i>		-.56			
OE_1 <i>Am not interested in abstract ideas</i>		-.54			
CCI_19 <i>Recombining existing elements in new ways</i>		.53			
OE_1R <i>Reversed—Am not interested in abstract ideas</i>		-.515			
OE_20 <i>Carry the conversation to a higher level</i>		.51			
OE_13 <i>Have difficulty understanding abstract ideas</i>		-.50			
OE_14 <i>Get excited by new ideas</i>		.47			
OE_13R <i>Reversed – Have difficulty understanding abstract ideas</i>		-.46			
OE_15 <i>Tend to vote for conservative political candidates</i>		-.44			
OE_7R <i>Reversed—Do not like art</i>		-.434			
OE_17 <i>Enjoy thinking about things</i>		.429			.349
OE_12R <i>Reversed – Believe that too much tax money goes to support artists</i>		-.42			
CCI_5 <i>Sudden moments of inspiration in waking life</i>	-.383	.418			
ECL_14 <i>I like music, dance and paintings that arouse new and unusual emotional reactions</i>		.410	.337		
OE_3R <i>Reversed - Am not interested in theoretical discussions</i>		-.41			
OE_15R <i>Reversed—Tend to vote for conservative political candidates</i>		-.401			
OE_19 <i>Avoid political discussions</i>		-.40			
OE_3 <i>Am not interested in theoretical discussions</i>		-.39			
CCI_15 <i>Playing with ideas</i>		.38			
OE_10R <i>Reversed—Do not enjoy going to art museums</i>		-.383			
OE_16 <i>Have a rich vocabulary</i>		.38			
OE_2 <i>Tend to vote for liberal politicians</i>		.364			
OE_8 <i>Do not like poetry</i>	-.302	-.360		-.315	
OE_11 <i>Can say things beautifully</i>		.35			
OE_8R <i>Reversed—Do not like poetry</i>					
ECL_20 <i>After an intensely emotional experience, I try to step back and examine by reactions objectively</i>					
OE_19R <i>Reversed—Avoid political discussions</i>					
ECL_8 <i>I sometimes experience feelings and emotions that cannot be easily described in ordinary language</i>	.329	.642			
ECL_28 <i>The range and diversity of my emotional reactions sometimes exceed my ability to describe how I feel</i>		.63			
ECL_18 <i>When in emotional situations, I tend to respond in a unique manner</i>		.62			
ECL_16 <i>I have emotional experiences that would be considered unusual or out of the ordinary</i>		.61			
MOOD_1 <i>My mood often changes from happiness to sadness, without my knowing why</i>		.596			.391
MOOD_2 <i>I have frequent ups and downs in mood without apparent cause</i>		.590			.379

ECL_24 I can experience a variety of different emotions at the same time			.50		
ECL_26 I prefer movies and books that depict complex and improbable emotional situations			.50		
ECL_19 I like to imagine situations that call for unusual, uncommon or unconventional emotional reactions			.49		
ECL_6 I can imagine myself being lonely, angry, joyful, all at the same time			.48		
ECL_23 I would have to be a poet or novelist to describe the kind of emotions I sometimes feel, they are so unique			.48		
ECL_30 I am able to experience a large number of different emotions			.469	.372	
ECL_27 I pay attention to other people's emotions so that I can better understand my own feelings			.462	.423	
ECL_10 I have felt combinations of emotions that other people probably would never have experienced			.44		
PPI_11 I often feel as if things are not real			.41		
ECL_1 Making discoveries through trial and error	.386		.404		
OE_9 Enjoy wild flights of fantasy			.35		
MOOD_3 In general I consider myself to be a very happy person			.30		
PPI_2 There have been times when I have stared at an object and it appeared to become larger and larger					
PPI_16 At least once in my life, just before falling down, I have had the intense sensation of a smell from childhood					
ECL_9 I am good at expressing my emotions				.68	
ECL_12 The way I experience and express my emotions helps me in my relationships with others				.67	
ECL_25 My emotions are a major source of meaning in my life; without them, my life would lack significance			.308	.631	
ECL_17 My emotions help me achieve my goals in life				.58	
ECL_5 I believe that people should work on their emotional development as hard as they work on their intellectual development			.338	.571	
ECL_29R Reversed- I try to disguise and hide my emotions				.56	
ECL_22 My outward emotional reactions accurately reflect my inner feelings				.55	
ECL_29 I try to disguise and hide my emotions			.315	.520	
ECL_13 My emotions are almost always an authentic expression of my true thoughts and feelings				.50	
ECL_4 I respond well in situations that call for new and unusual emotional responses				.49	
ECL_3 I try to be honest about my emotional reactions, even when it causes me problems				.49	
ECL_11R Reversed – I am not particularly interested in the emotional aspects of my life				.48	
ECL_11 I am not particularly interested in the emotional aspects of my life				-.48	
ECL_7 I think about and try to understand my emotional reactions			.333	.461	
ECL_15 I think about past emotional experiences to help me cope with current emotional problems			.361	.459	
ECL_2 When I have strong emotional reactions, I search for reasons for my feelings			.344	.409	

ECL_21 <i>When responding emotionally, I can be quite inventive and innovative</i>			.344	.391	
OE_18 <i>Rarely look for deeper meaning in things</i>				-.331	
OE_18R <i>Reversed—Rarely look for deeper meaning in things</i>					
CCI_6 <i>Rational, logical thought</i>					.83
CCI_4 <i>Methodical and systematic problem solving</i>					.903
CCI_8 <i>The careful selection of ideas</i>					.79
CCI_20 <i>Working with a set goal or outcome in mind</i>					.78
PPI_14 <i>I have had experiences when I felt as if I was somewhere else</i>	.336				.548
PPI_13 <i>Once, in a crowded area, I suddenly could not recognise where I was</i>					.54
PPI_15 <i>I have dreams of floating or flying through the air at least once a year</i>					.34

8. <i>Non-verbal modes of thinking</i>	◦	◦	◦	◦	◦
9. <i>Paying attention to visual imagery</i>	◦	◦	◦	◦	◦
10. <i>Meditation</i>	◦	◦	◦	◦	◦
11. <i>Ideas arising whilst dreaming</i>	◦	◦	◦	◦	◦
12. <i>Ideas arising as falling asleep or waking up</i>	◦	◦	◦	◦	◦
13. <i>Luck, chance, 'fortunate accidents'</i>	◦	◦	◦	◦	◦
14. <i>Following your intuition</i>	◦	◦	◦	◦	◦
15. <i>Day dreaming</i>	◦	◦	◦	◦	◦
16. <i>The use of analogy</i>	◦	◦	◦	◦	◦
17. <i>Playing with ideas</i>	◦	◦	◦	◦	◦
18. <i>Rational, logical thought</i>	◦	◦	◦	◦	◦
19. <i>The careful selection of ideas</i>	◦	◦	◦	◦	◦
20. <i>Working with a set goal or outcome in mind</i>	◦	◦	◦	◦	◦
	No		Yes		
21. <i>When I have a tough decision to make a sign will be given and I will know what to do</i>	◦		◦		
22. <i>Sometimes an event will occur that has a special significance for me only</i>	◦		◦		
23. <i>I have had a vision</i>	◦		◦		
24. <i>Sometimes in the early morning hours between</i>	◦		◦		

- midnight and 4
a.m. my
experiences are
very meaningful*
25. *At least once a
month, I
experience
intense smells
that do not have
an obvious
source*
26. *I use 'hunches'
more than
simple learning
to solve a new
problem*
27. *When I walk up
stairs, I
sometimes note
a strange smell
from somewhere
else*
28. *When relaxed or
just before
falling asleep, I
sometimes feel
pleasant
vibrations
moving through
my whole body*
29. *Whilst sitting
quietly I have
had uplifting
sensations as if I
were driving
quickly over a
road*
30. *I often feel as if
things are not
real*
31. *Once, in a
crowded area, I
suddenly could
not recognise
where I was*
32. *I have dreams of
floating or
flying through
the air at least
once a year*
-

To what extent are the following statements an accurate description of you?

	Very inaccurate	Moderately inaccurate	Neither inaccurate or accurate	Moderately accurate	Very accurate
33. <i>Have a vivid imagination</i>	○	○	○	○	○
34. <i>Do not enjoy going to art museums</i>	○	○	○	○	○
35. <i>Do not like art</i>	○	○	○	○	○
36. <i>Enjoy hearing new ideas</i>	○	○	○	○	○
37. <i>Believe that too much tax money goes to support artists</i>	○	○	○	○	○
38. <i>Am not interested in abstract ideas</i>	○	○	○	○	○
39. <i>Recombining existing elements in new ways</i>	○	○	○	○	○
40. <i>Carry the conversation to a higher level</i>	○	○	○	○	○
41. <i>Have difficulty understanding abstract ideas</i>	○	○	○	○	○
42. <i>Get excited by new ideas</i>	○	○	○	○	○
43. <i>Tend to vote for conservative political candidates</i>	○	○	○	○	○
44. <i>Avoid political discussions</i>	○	○	○	○	○
45. <i>Am not interested in theoretical discussions</i>	○	○	○	○	○
46. <i>Have a rich vocabulary</i>	○	○	○	○	○
47. <i>Can say things beautifully</i>	○	○	○	○	○
48. <i>Enjoy wild flights of fantasy</i>	○	○	○	○	○

To what extent are the following statements concerning the way you think, feel and react in a variety of situations an accurate description of you?

	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
49. <i>The range and diversity of my emotional reactions sometimes exceed my ability to describe how I feel</i>	○	○	○	○	○
50. <i>When in emotional situations, I tend to respond in a unique manner</i>	○	○	○	○	○
51. <i>I have emotional experiences that would be considered unusual or out of the ordinary</i>	○	○	○	○	○
52. <i>I can experience a variety of different emotions at the same time</i>	○	○	○	○	○
53. <i>I prefer movies and books that depict complex and improbable emotional situations</i>	○	○	○	○	○
54. <i>I like to imagine situations that call for unusual, uncommon or unconventional emotional reactions</i>	○	○	○	○	○
55. <i>I can imagine myself being lonely, angry, joyful, all at the same time</i>	○	○	○	○	○
56. <i>I would have to be a poet or novelist to</i>	○	○	○	○	○

*describe the
kind of emotions
I sometimes feel,
they are so
unique*

- | | | | | | |
|--|---|---|---|---|---|
| 57. I have felt combinations of emotions that other people probably would never have experienced | ° | ° | ° | ° | ° |
| 58. I am good at expressing my emotions | ° | ° | ° | ° | ° |
| 59. The way I experience and express my emotions helps me in my relationships with others | ° | ° | ° | ° | ° |
| 60. My emotions help me achieve my goals in life | ° | ° | ° | ° | ° |
| 61. I try to disguise and hide my emotions | ° | ° | ° | ° | ° |
| 62. My outward emotional reactions accurately reflect my inner feelings | ° | ° | ° | ° | ° |
| 63. My emotions are almost always an authentic expression of my true thoughts and feelings | ° | ° | ° | ° | ° |
| 64. I respond well in situations that call for new and unusual emotional responses | ° | ° | ° | ° | ° |
| 65. I try to be honest about my emotional reactions, even | ° | ° | ° | ° | ° |

APPENDIX A.9 *Copies of the measures used in Experiments One, Two and Three*

A.9.1 Perceived Stress Scale (Cohen, Kamarck, & Mermelstein, A global measure of perceived stress, 1983)

Perceived Stress Scale- 10 Item

Instructions: The questions in this scale ask you about your feelings and thoughts during the last month. In each case, please indicate with a check how often you felt or thought a certain way.

1. In the last month, how often have you been upset because of something that happened unexpectedly?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

2. In the last month, how often have you felt that you were unable to control the important things in your life?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

3. In the last month, how often have you felt nervous and "stressed"?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

4. In the last month, how often have you felt confident about your ability to handle your personal problems?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

5. In the last month, how often have you felt that things were going your way?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

6. In the last month, how often have you found that you could not cope with all the things that you had to do?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

7. In the last month, how often have you been able to control irritations in your life?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

8. In the last month, how often have you felt that you were on top of things?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

9. In the last month, how often have you been angered because of things that were outside of your control?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

___0=never ___1=almost never ___2=sometimes ___3=fairly often ___4=very often

A.9.2 Experiment/Experimenter Attitudes Rating Scale (EARS) (Nichols & Maner, 2008)

1. Would you participate in a study with this experimenter in the future?

[illegible]

2. How friendly do you think the experimenter was?

[illegible]

3. How likeable did you think the experimenter was?

[illegible]

4. How attractive do you think the experimenter is to the opposite sex?

[illegible]

5. How much do you care about whether the experimenter's study works?

[illegible]

A.9.3 Interaction Questionnaire (Sherwood, Roe, Holt, & Wilson, 2005)

Interaction questionnaire

Participant number	
Date	
Experimental condition	

1. How would you rate your current mood?

Negative							Positive
1	2	3	4	5	6	7	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

2. How do you feel at this moment?

Negative							Positive
1	2	3	4	5	6	7	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

3. How would you rate the experimenter/participant interaction in terms of warmth, spontaneity and positivity?

Negative							Positive
1	2	3	4	5	6	7	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

'Rehearsed'							Spontaneous
1	2	3	4	5	6	7	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Very negative							Very positive
1	2	3	4	5	6	7	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

4. How would you describe the quality of the rapport that you have with the participant?

Negative							Positive
1	2	3	4	5	6	7	
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

5. How confident are you that today's experiment will be a success?

Negative							Positive
1	2	3	4	5	6	7	



APPENDIX A.10 *Frequency distribution histograms for the combined data for ratings from the levels of RNG lability (Table, Pseudo, High) and scores of individual lability*

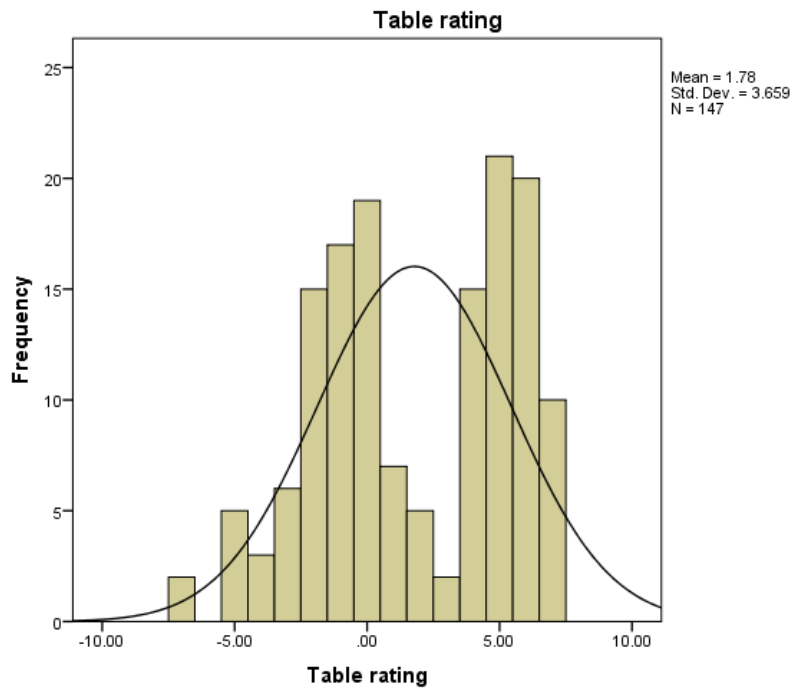


Figure 1.21 *Table RNG*

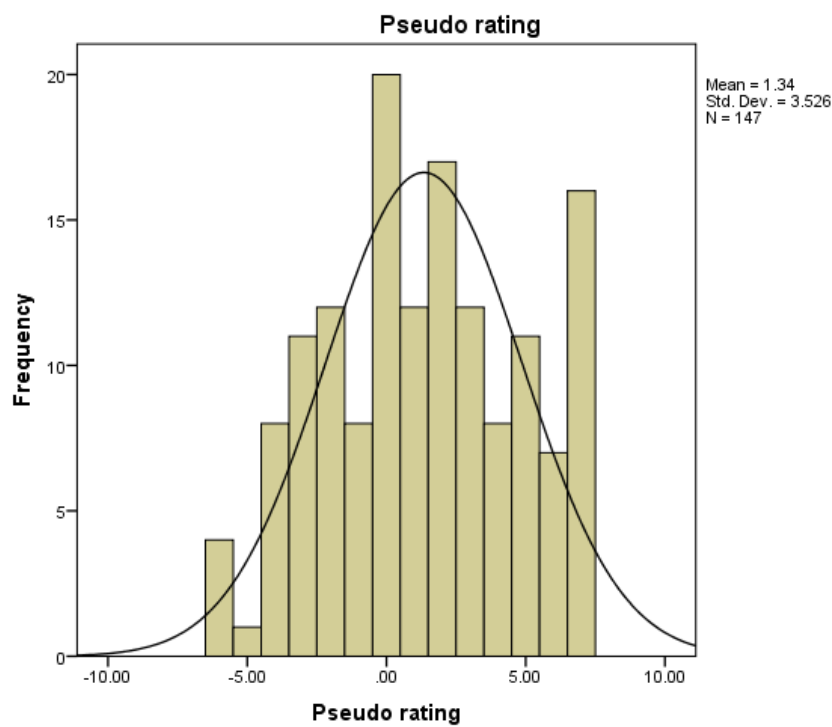


Figure 1.22 *Pseudo RNG*

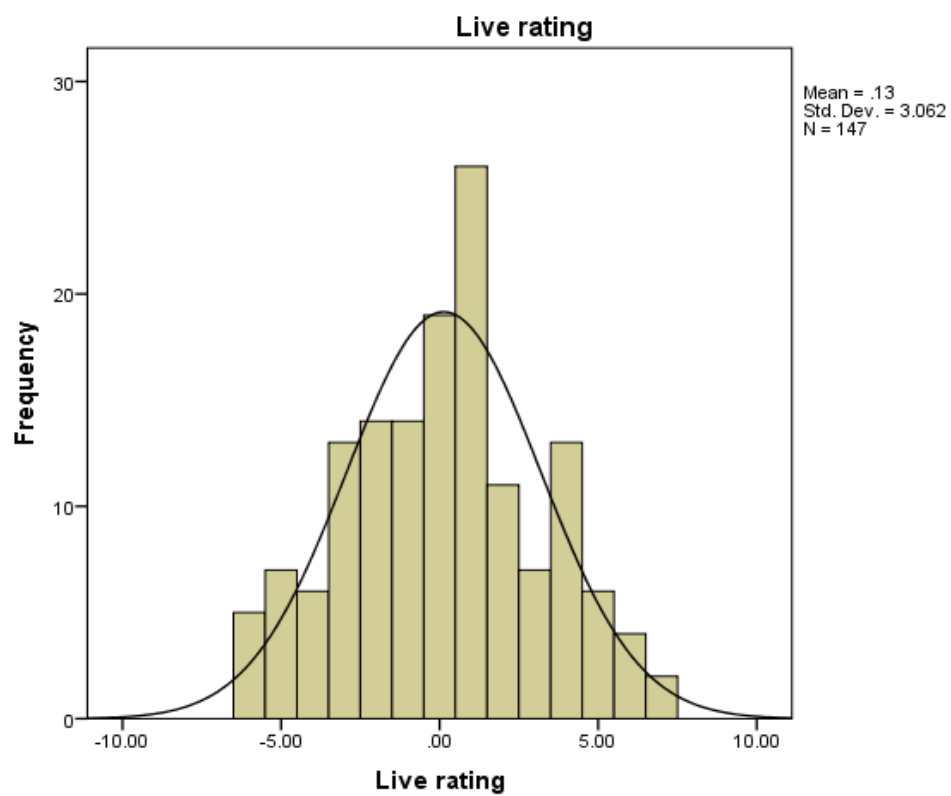


Figure 1.23 *Live RNG*

APPENDIX A.11 *The Revised Liability Scale (RLS)*

The Revised Liability Scale

To what extent are the following experiences or processes important to you? Please respond from '1' – totally disagree to '5' = totally agree.

Totally disagree	Partially disagree	I am undecided	Partially agree	Totally agree
1	2	3	4	5

1. I have a vivid imagination

1	2	3	4	5
---	---	---	---	---

2. I enjoy hearing new ideas

1	2	3	4	5
---	---	---	---	---

3. I have difficulty understanding abstract ideas

1	2	3	4	5
---	---	---	---	---

4. I am not interested in theoretical discussion

1	2	3	4	5
---	---	---	---	---

5. I am not interested in abstract ideas

1	2	3	4	5
---	---	---	---	---

6. Recombining existing elements in new ways

1	2	3	4	5
---	---	---	---	---

7. When I have a tough decision to make a sign will be given and I will know what to do

1	2	3	4	5
---	---	---	---	---

8. In general, I consider myself to be a very happy person

1	2	3	4	5
---	---	---	---	---

9. I have a rich vocabulary

1	2	3	4	5
---	---	---	---	---

10. I get excited by new ideas

1	2	3	4	5
---	---	---	---	---

11. I can say beautiful things

1	2	3	4	5
---	---	---	---	---

12. I carry the conversation to a higher level

1	2	3	4	5
---	---	---	---	---

13. I enjoy wild flights of fantasy

1	2	3	4	5
---	---	---	---	---

14. I have a rich vocabulary

1	2	3	4	5
---	---	---	---	---

15. I am not particularly interested in the emotional aspects of my life

1	2	3	4	5
---	---	---	---	---

16. My emotions are almost always an authentic expression of my true thought and feelings

1	2	3	4	5
---	---	---	---	---

17. My outward emotional reactions accurately reflect my inner feelings

1	2	3	4	5
---	---	---	---	---

18. I am good at expressing my emotions

1	2	3	4	5
---	---	---	---	---

19. I try to be honest about my emotional reactions, even when it causes me problems

1	2	3	4	5
---	---	---	---	---

20. The way I experience and express my emotions helps me in my relationships with others

1	2	3	4	5
---	---	---	---	---

21. I respond well in situations that call for new and unusual emotional responses

1	2	3	4	5
---	---	---	---	---

22. My emotions help me achieve the goals in my life

1	2	3	4	5
---	---	---	---	---

23. I try to disguise and hide my emotions

1	2	3	4	5
---	---	---	---	---

24. I like to imagine situations that call for unusual, uncommon or unconventional emotional reactions

1	2	3	4	5
---	---	---	---	---

25. I would have to be a poet or novelist to describe the kind of emotions I sometimes feel, they are so unique

1	2	3	4	5
---	---	---	---	---

26. A sense of purpose that seems to come from beyond the self

1	2	3	4	5
---	---	---	---	---

27. A sense of communicating with something other

1	2	3	4	5
---	---	---	---	---

28. A sense of communicating with a deeper self

1	2	3	4	5
---	---	---	---	---

29. A sense of channelling information

1	2	3	4	5
---	---	---	---	---

30. Meditation

1	2	3	4	5
---	---	---	---	---

31. I have had a vision

1	2	3	4	5
---	---	---	---	---

32. Sometimes an event will occur that has special significance for me only

1	2	3	4	5
---	---	---	---	---

APPENDIX A.12 *Frequency distribution histograms of the Revised Liability Scale and inherent components*

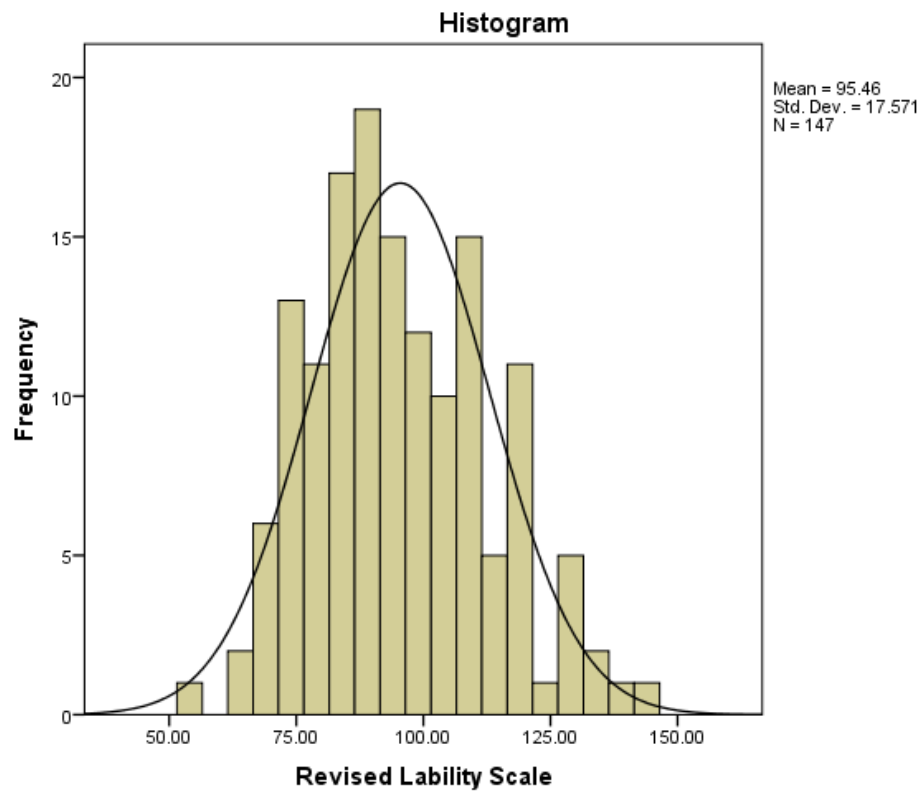


Figure 1.24 *The Revised Liability Scale*

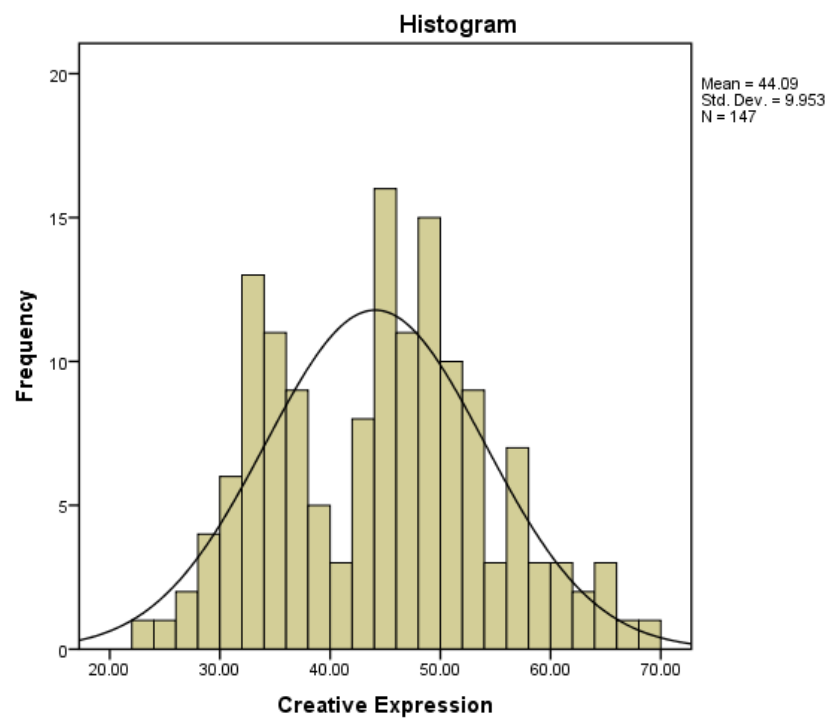


Figure 1.25 *Creative Expression subscale scores*

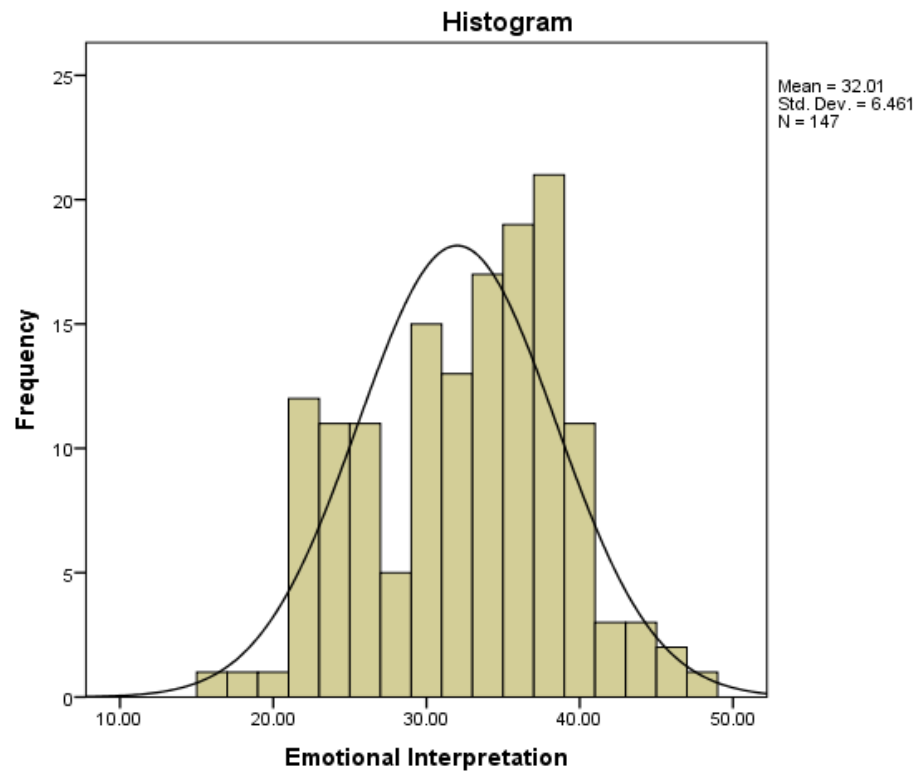


Figure 1.26. *Emotional Interpretation* subscale scores

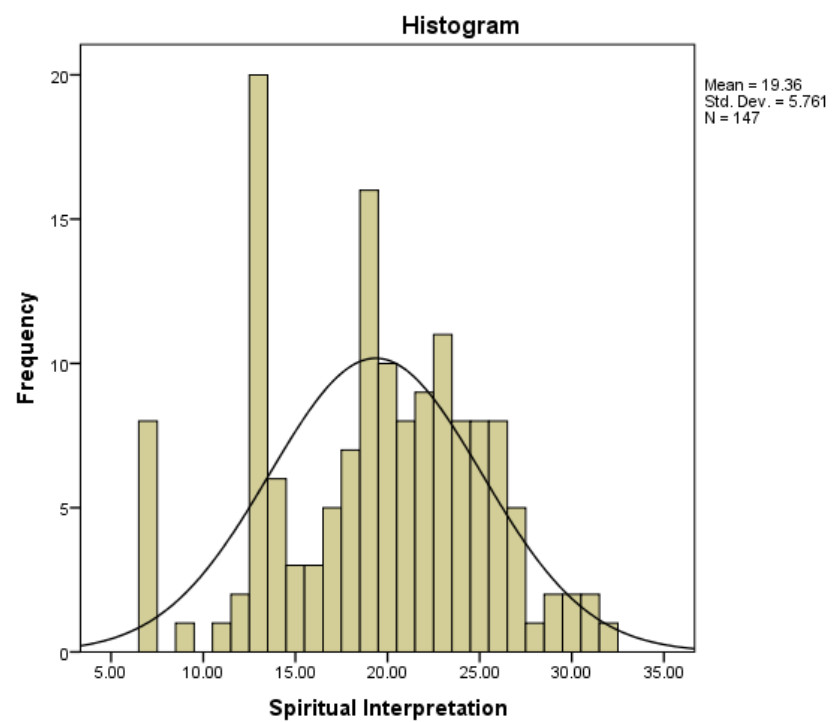


Figure 1.27. *Spiritual Interpretation* subscale scores

APPENDIX A.13 *Differences between male and female scores for the Revised Liability Scale and identified factors*

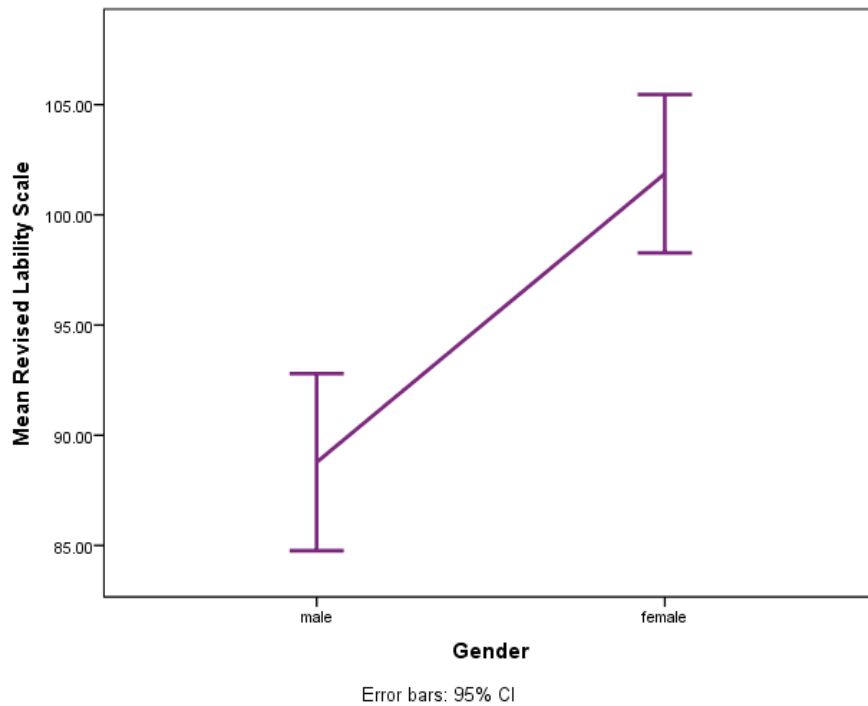


Figure 1.28 *Line graph with 95% confidence interval error bars showing the differences between male and female scores and female scores on the Revised Liability Scale*

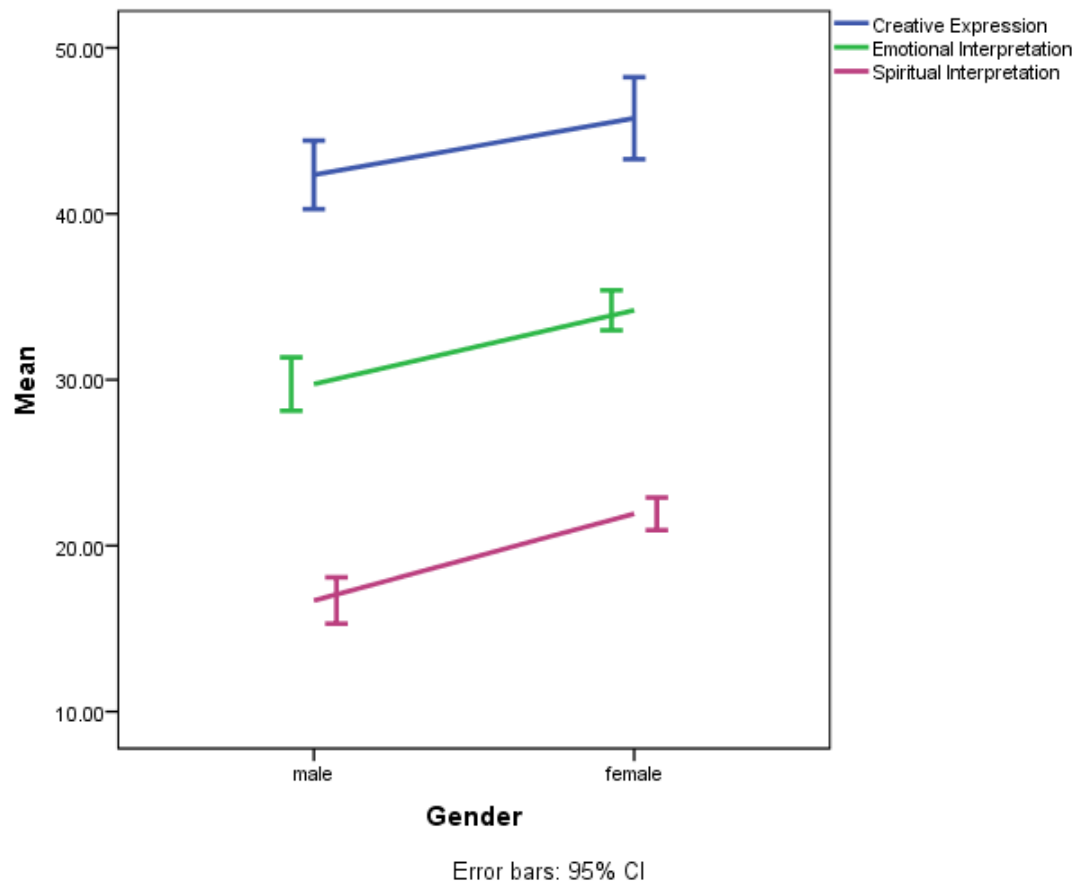


Figure 1.29 Multiple line graph with 95% confidence interval error bars showing the differences between male and female scores for the three identified liability factors of Creative Expression, Emotional Interpretation and Spiritual Interpretation